

**THE
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DIESEL RAILWAY TRACTION

The July issue of this RAILWAY GAZETTE publication, illustrating and describing developments in Diesel Railway Traction, will be ready on July 1, price 2s.

Sixth Edition

BRITISH LOCOMOTIVE TYPES

This new edition has been completely revised and contains many additional plates. There are in all 140 outline diagrams, compiled from official drawings, giving main dimensions of all the standard and other principal classes of locomotives in use on the four main-line railways.

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THE RAILWAY GAZETTE

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More Staff for British Railways

ON a later page is a summary of the British Transport Commission's *Transport Statistics* for the third four-weekly period of this year, together with our comments on the results. The purpose of this note is to draw attention to the increase of 10,304 in the number of staff employed by British Railways since January 1. An article on page 675 of our June 11 issue pointed out that over 6,000 persons had been added to the railway staff during the first eight weeks of the year. In the next four weeks, ended March 21, there was a further increase of 4,201. Appointments were made to every grade of staff. The largest addition, 1,218, was made to the grades described as "drivers, motormen, firemen and cleaners," which became understaffed during the war, but it is not obvious why another 1,051 men were needed for the other operating staff, now numbering 239,379. The most disquieting feature of the staff records is the continuous growth of the salaried grade. In the March period, no fewer than 717 persons were added to the salaries paybill, making a total addition of 2,526 in the first 12 weeks of nationalisation. The public will have to bear the cost, either in the form of increased charges or in taxation, and is surely entitled to an explanation of the policy which the Railway Executive is pursuing.

* * * *

Mr. R. S. Griffiths

The signal engineering profession has lost one who had been long acknowledged as being among its most distinguished members in the person of Mr. R. S. Griffiths, whose death on June 15 we record, and of whom a portrait and biography appear on another page. When Mr. Griffiths retired in 1946 he had completed 54 years' service with the Westinghouse Brake & Signal Co. Ltd. and its incorporated firm of McKenzie & Holland Limited. His early years were passed in a house which served as the London offices of McKenzie & Holland, of Worcester, which his father served with distinction for a long period. He gained a very varied experience, by which he profited to the full; and he combined a wide acquaintance with signalling apparatus with an equally extensive knowledge of railway operating problems, enabling him to discuss any question with discernment and authority. Primarily a mechanical signalling engineer, he had considerable knowledge of power signalling and had been concerned with many such installations. He was also a learned signalling historian. His year of office as President of the Institution of Railway Signal Engineers was one of the Institution's most successful, and he continued to serve that body with no less devotion and enthusiasm to within a few days of his death. The work he did in connection with the re-drafting of the Articles of Association was an extremely valuable service to its members, by whom indeed he will be very greatly missed and long affectionately remembered.

* * * *

Railway Fares and Charges Review

Some letters to the Editor of *The Manchester Guardian* on railway fares have brought a reply from the Railway Executive, which emphasises that a review of railway charges is already in hand. It points out that under the Transport Act the British Transport Commission and the Railway Executive are required to undertake a complete review of passenger fares and that the Commission has to present a scheme to the new Transport Tribunal within a period of two years or such longer period as the Minister may allow. The various disparities in fares, both on the railways and between railways and other forms of transport, cannot be resolved piecemeal, but the Railway Executive hopes that in due course it will be possible to adjust them in a manner best calculated to serve the public interest. As to workmen's tickets, it is pointed out that their issue is required by Acts of Parliament, and the times at which they are available are also laid down; these must not clash with peak-hour travel. The reason for the re-introduction of cheap-day fares is a desire to attract as many passengers as possible in the off-peak hours, so as to obtain the maximum use of rolling stock. It is not in the interests of morning essential business travel to seek to attract further passengers during the morning peak hour, between 8 a.m. and 9 a.m., when the

trains generally are fully loaded for the most part with season-ticket holders, who, although able to travel at a low fare per mile, are an economic proposition to the railways.

Great Western of Brazil Railway

An improved showing was made by the Great Western of Brazil Railway Co. Ltd., during the year to December 31, 1947. The report of the directors shows that operating results in sterling resulted in an increase of £9,697 as compared with 1946. Gross receipts at £1,801,571 were higher by £196,570, while working expenses at £1,633,037 rose by £186,873. After adding registration fees, interests and discount, and exchange differences, and deducting the amount due to the Brazilian Government for audit and rental, the debenture interest on sinking fund, and making provision for both Brazilian and British taxation, the surplus for the year was £20,163, which compared with £14,832. The deficit brought forward from 1946 was £188,208, and the interest accrued for the year 1946 on debenture redeemed and cancelled during 1947, was £1,414, leaving a deficit to be carried forward of £166,631. The increase in gross receipts for the greater part was absorbed in the higher cost of salaries and wages, but during the year one and a half year's arrears of debenture interest were over-taken and the requisite sums appropriated to the sinking fund. A further half-year's interest was paid on March 25 this year in respect of the six months ended December 31, 1946.

Overseas Railway Traffics

The \$28,757 decrease in Bolivar traffics for April, has been followed by a further unsatisfactory month, in which receipts at \$23,890, compare with \$115,230 last year. The decline of \$91,340 in May, was accounted for by a strike, and aggregate traffics since January 1 now are down by \$166,167. The recent setback which has been registered in Leopoldina traffics continued, and at \$45,381 and \$41,936 for the two weeks under review, receipts were \$36,226 below last year. As a result, aggregate figures are down by \$278,691 since January 1. Although the increases in Great Western of Brazil continued in the week ended June 5, when receipts at £27,100 were £4,700 above those for last year, the upward trend was not maintained, and a small decline of £900 was registered in the following week. Further gains were made on both the Antofagasta (Chili) & Bolivia and the Paraguay Central, and the aggregate figures are up by £284,990 and \$204,475 respectively. Though the United of Havana aggregate for fifty weeks shows a gain of £318,100, traffics for the fortnight ended June 12 fell by £27,486; previous small increases in Uruguay Northern did not continue, and at £1,850, receipts for May were down by £1,615.

Railways in East Africa

In the House of Commons on June 14 East African development was debated on the motion for the adjournment. As might be expected, the key position to the wider development of this territory which is occupied by the railways attracted some attention. Squadron-Leader Kinghorn said that he had information that there had been considerable improvement on the railways in Rhodesia, but that the great difficulty was that houses for skilled workers were lacking, and that this was having its effect on the rolling stock position. The Under-Secretary of State for the Colonies, Mr. Rees-Williams, agreed with points made by members that vital industries should be built up in East Africa and he put railways and docks among the urgent priorities. He said it was essential that the African railways should be improved as speedily as possible, because it was no good undertaking developments in East Africa if the railways could not handle the traffic. This would mean not only the supply of rails, wagons, and locomotives, but the realignment of track. He added that in a ten-year plan for East Africa some £10,600,000 was being spent on roads and also £1,750,000 on regional road development, to be paid for by the Government. Some £4,500,000 was being spent on housing, apart from private enterprise, and he believed that help could be given with technicians from this country.

Improved Punctuality in the Southern Region

Mr. S. W. Smart, Superintendent of Operation, Southern Region, is well known for the efforts he makes to impress on all staff responsible for the running of the trains, the need for obtaining a high standard of punctuality. One of the means he adopts is to insert in the *Southern Region Magazine* from time to time the results of the efforts made in this direction. The latest details published show that considerable success is being obtained in good timekeeping, and that the present standard is the best recorded since the war. Average minutes late on arrival during weekdays, during the four weeks ended April 17, were no more than 0.94 for steam trains and 0.79 for electric trains. The following shows the comparison with various periods back to December, 1945.

AVERAGE MINUTES LATE ARRIVAL (WEEKDAYS)

	1945 Dec. 29	1946 Apr. 20	1947 Apr. 19	1948 Apr. 17
Steam trains	8.06	1.89	2.13	0.94
Electric trains	4.97	1.45	2.09	0.79
Freight trains	25.6	12.5	7.3	2.5

The working of freight trains was also exceptionally good, as will be seen from the last line in the above table. In congratulating his staff, Mr. Smart points out that these time-keeping achievements reflect great credit on those responsible for the running of trains, and he adds that the continued co-operation of passengers in joining and alighting quickly and also in the closing of carriage doors is much appreciated.

The Severn Tunnel

The construction of a tunnel under the estuary of the Severn, to shorten the route from London to South Wales, via Gloucester, and to supersede the ferry from New Passage to Portskewett, was proposed by Charles Richardson, a former pupil of Brunel, in 1863. Two attempts to launch the scheme failed for lack of funds, but an Act for the construction of the tunnel was obtained by the Great Western Railway in 1872. The tunnel is over 4½ miles long, and is the longest main-line railway tunnel in Great Britain. At the present time, it stands 27th in length among the world's long railway tunnels. Irruptions of water from an underground stream caused exceptional difficulties during its construction, and delayed the opening of the railway until 1886. Special pumping plant is installed to intercept this stream, before it reaches the tunnel, and separate pumps are provided, on each side of the estuary, to empty the drainage sumps. Ventilation is assisted by a forced draught from an induction fan, on the west side of the river. The inspection and maintenance of the tunnel, and renewal of the track, are described in detail elsewhere in this issue. The work is carried out on Sundays, when the engineers can be granted absolute possession of both tracks, and is spread over several week-ends. Main-line trains are then diverted through Gloucester, and local traffic uses the Severn Bridge, at Lydney.

Manchester Victoria Accident, L.M.S.R.

No facts were in dispute regarding the accident which occurred on December 10, 1947, at Victoria Station, Manchester, when a train of loaded petrol wagons, which had got out of control while descending the steep incline from Miles Platting, was diverted to avoid a collision with another freight train and ran into the buffer stops of No. 7 platform. As shown in Brigadier C. A. Langley's report, summarised in this issue, all concerned acted for the best and with much promptitude, but the driver, who had the misfortune to receive fatal injuries, misjudged the ability of his engine to control the load in the circumstances obtaining. There was a prohibition on the pinning down of brakes on wagons loaded with spirit—one peculiar to the former L.M.S.R. and imposed from a fear of danger from sparks. It therefore was not possible to follow the practice adopted with ordinary freight trains at such locations. An assistant engine could have been provided, and would have been had the control staff realised that the train was loaded with petrol, a fact which escaped notice in the pressure of work arising from extra heavy coal traffic. The accident was thus an accident in the true sense, no breach of

regulations or carelessness entering into it, and Brigadier Langley's comments on the case and the desirability of reviewing the brake-pinning restriction speak for themselves.

* * *

The "Merchant Navy" Pacifics

The appearance of the first "Merchant Navy" class Pacific locomotive some seven years ago, was an important event in British locomotive history, for not only was this the first 4-6-2 tender locomotive to be built by the Southern Railway, it was also the first of a class which combined a most unusual number of technical innovations. Among the many features Mr. O. V. Bulleid, then Chief Mechanical Engineer, Southern Railway, included in the design, were, a high-pressure boiler of 280 lb. per sq. in. with a welded-steel firebox and thermic syphons, a new valve gear, and an enclosed motion with pump lubrication. At present, 20 of these locomotives, as well as over 70 similar lightweight machines are in service, and on the road they have proved highly capable performers. The latest modification to the "Merchant Navy" engines is the fitting to No. 35005 *Canadian Pacific* of a mechanical stoker, a description of which appears elsewhere in this issue. For some time Mr. Bulleid has held the opinion that a mechanical stoker is necessary to ensure adequate steam-raising under all conditions, and it is noteworthy that in trials with specially selected poor-quality coal, steaming was at a rate sufficient to deal with any required duty.

* * *

Uruguayan Railways' Sale Terms

FULL details have now been published of the proposals for the allocation of the net proceeds of the sale of the British railways in Uruguay among the debenture and stockholders. The necessary meetings to implement the scheme have been called for June 28 in the case of the Central Uruguay Railway Co. of Monte Video Ltd., the Midland Uruguay Railway Co. Ltd., and the Midland Uruguay Extension Railway Co. Ltd.; those of the North West of Uruguay Railway Co. Ltd., the Quarahim International Bridge Co. Ltd., and the Uruguay Northern Railway Co. Ltd., will be held on June 29. Brig.-General F. B. Hammond, Chairman of the Central Uruguay, in a circular to stockholders, recalls the visit of himself, Mr. H. H. Grindley, and Mr. H. J. Binder to Montevideo in November last year, as a result of which an agreement was reached in March under which substantially the whole of the undertakings in Uruguay of the undermentioned British companies are to be acquired by the Uruguayan Government at the prices shown:—

The Central Uruguay Railway Co. of Monte Video Limited ("Central")	£ 5,591,000
The Uruguay Northern Railway Co. Ltd.	259,000
The Midland Uruguay Railway Co. Ltd.	802,000
Midland Uruguay Extension Railway Co. Ltd.	130,000
The North Western of Uruguay Railway Co. Ltd.	318,000
The Quarahim International Bridge Co. Ltd.	50,000

The scheme of arrangement provides that the following redemption prices shall be paid for the various classes of debentures and also gives the estimated amount to be distributed on other classes of stock.

Security	Amount outstanding	Redemption price for distribution
	£	Per cent.
Central 4½ per cent. 1st deb.	1,150,000	100
Central 5 per cent. 2nd deb.	3,740,000	85
Central ord.	6,000,000	12½
Northern 5 per cent. prior lien deb.	49,002	105
Northern 5 per cent. income deb.	449,400	34
Northern 7 per cent. cum. pref.	250,000	10
Northern ord.	100,000	2½
Midland 5 per cent. prior lien deb.	162,773	100
Midland 5 per cent. deb.	1,156,918	48½
Midland ord.	600,000	7½
Extension 5 per cent. deb. stock	200,000	60
North Western 6 per cent. 2nd deb. stock	57,031	110
North Western 6 per cent. 1st pref.	583,850	32
North Western 5 per cent. 2nd pref.	293,173	11
North Western ord.	120,120	5
Quarahim 5 per cent. 1st deb.	84,865	70

The circular points out that among the factors relative to the advisability of selling the railway have been the fall in the sterling value of the peso and the rise in the cost of stores and materials, to which has to be added a sharp advance in the cost of wages. Operating receipts have suffered from competition by road and there appears to be no chance of a reduction in expenditure. Gross receipts for the first eight

months of the current financial year, to June, 1948, have fallen by approximately 7 per cent. while expenditure has increased by 12 per cent. From the Uruguayan point of view some of these factors are within the control of the Uruguayan Government, which will have a direct interest in the co-ordination of all forms of transport and thus will relieve the railways of many of the losses due to unrivalled competition.

It is proposed to set aside certain sums in respect of pensions for some past and present members of the staff in Uruguay and for pensions and compensation for loss of employment to staff in London. Mr. A. J. Medlycott, who is Secretary to all the companies, is entitled to the benefit of a policy securing a pension of £466 a year at the age of 60. It is proposed to grant him as compensation for loss of office a sum of £7,088 and to apply a sum of £15,082 to the purchase for him of an additional annuity. The directors are entitled under the articles of association to a total remuneration of £6,000 a year. During the last nine years they have drawn an average of £4,180 a year and have waived the balance. The proposals put forward for compensation to the directors for loss of office are shown below:—

	Payable by Central	Payable by Northern	Payable by Midland	Payable by Extension	Payable by North Western	Total
	£	£	£	£	£	£
Brig.-General F. D. Hammond	7,500	1,350	2,000	400	1,750	13,000
P. L. Fleming	3,750	—	1,286	—	1,250	6,286
H. H. Grindley	2,500	150	375	100	225	3,350
C. R. S. Harris	3,750	—	—	—	—	3,750
B. H. Binder	—	—	—	375	1,250	1,625
H. J. Binder	—	750	1,286	—	—	2,036
Brig. W. H. Crosland	—	—	—	375	—	375
A. J. Medlycott	—	750	1,285	—	—	2,035
Total	17,500	3,000	6,232	1,250	4,475	32,457

In addition to the above, it is proposed that £25,930 shall be paid towards the total cost of a pension to Mr. H. H. Grindley in respect of his services with all the companies. It is recalled that he has served for 22 years as General Manager of the Central Uruguay Railway in circumstances of increasing difficulty and latterly has served as Managing Director of the other five companies.

* * *

U.S.A. Railway Position

AT the end of war, the U.S.A. railways stood well with their public on the whole, but the return to a peacetime footing has not been easy and, somewhat irrationally, there has been of late a marked change in sentiment. While the railways are passing through a transition period, they are expected by critics in a hurry to provide service of an impeccable kind before they have had a chance to make good the effects of wartime usage on their lines and rolling stock. Last year freight transport in the States was at record heights, save for the war years 1943 to 1945. Wagon shortages were serious and the delivery of new wagons was retarded by the scarcity of steel. Towards the end of 1947, the railways got over the worst troubles about wagon supply, but 1948 brought fresh difficulties. Weather in the early months was phenomenally bad; the coal strike from March 15 to April 13 hit the railways hard, and on May 10 President Truman directed the Secretary of the Army to take over the railways and operate them in the name of the Government.

The President took action because 3 of the 22 railway labour unions had rejected the findings of an Emergency Board in a wages dispute and had called a strike for the morning of May 11. In issuing his order, the President said that a railway strike would be a nation-wide tragedy, and the Government would therefore take steps to assure uninterrupted transport. He called on every railway worker to co-operate with the Government by remaining on duty and on the union officials to keep their members at work. The strike was averted, but the public is growing tired of labour disputes. This is the third time within five years that the Government has been forced to take over the railways to avoid a disastrous stoppage of transport. It is not surprising that in some quarters impatience with railway management is felt, and suggestions have been made by a few extremists that the railways should be nationalised.

On behalf of the railways it can be urged that they have granted liberal advances in pay to their 1,352,000 employees.

The average yearly payment to each person rose from \$1,887 in 1939 to \$3,218 in 1947, or by 70 per cent. Further substantial increases in rates of pay take effect as from last November, so that 1948 payrolls will soar to a new peak. Simultaneously, railway material prices have risen year by year since 1939, the increase last year being nearly 20 per cent. over 1946. As in Great Britain, the price of fuel, both coal and oil, is especially high. Cheap transport is equally out of the question under private ownership in the States and under State ownership here. During 1947 rates and fares were increased in both countries and a further advance in American freight rates came into force on May 6, 1948.

Americans, who spend money lavishly on the amenities and amusements of life, appear to grudge paying railway charges, though these remain at a comparatively low level. In 1947 average revenue per ton-mile crossed the one-cent line for the first time since 1932, but was no higher than the 1-076 cents charged in 1929. Average revenue per passenger-mile exceeded two cents for the first time since 1933, but was well below the 1929 level, and on many lines passenger business is an unremunerative side-show. Even a great passenger-carrying line like the New York Central, running many famous expresses, earned a profit of only \$1,250,000 from its passenger operations in 1946; the Chesapeake & Ohio, primarily a coal line, lost \$7,810,000 on its small passenger business.

Freight revenue represents 81 per cent. of the total operating revenues of the U.S.A. railways. The increase of \$1,254 million under that head for 1947 over 1946 was \$5 million more than the total takings from passengers, mails and express. For the present year a decrease of about 3 per cent. in the volume of freight movement was expected. To the middle of May the actual decrease was at double that rate, but traffic then showed signs of reviving and should be heavy during the rest of the year, if industry is free from strikes. Passenger-miles in 1947 were 29 per cent. below 1946, and another decrease of 13 per cent. is estimated to occur this year. If this forecast turns out to be correct, passenger traffic will be 70 per cent. above 1939; whether it can be held there is doubtful, in spite of much expenditure on high-speed diesel-electric trains, through sleeping-cars and other facilities. The average speed of passenger trains is 37.5 miles an hour—more than twice the average speed on British Railways, but slow compared with the velocity of the average American high-powered motorcar.

On the whole, freight trains in the States run as fast as our passenger trains, covering 16 miles an hour. The Santa Fé, with its long hauls, brought the average speed of its freight trains to 19.6 miles an hour last year, using diesel power freely for haulage as many other lines are doing. "Overnighters" to the number of 89 are run by 25 of the principal railways between important centres 300 or more miles apart. These trains are loaded in the late afternoon and give delivery next morning. A good example is the Illinois Central overnight service between Chicago and Memphis, 510 miles distant.

For overall freight operating the best index of efficiency is "net ton-miles per freight train-hour." Between 1939 and 1947, this statistic moved from 13,450 to 18,126, an improvement of 34 per cent. The highest comparable figure reached by our railways was 1,120 in 1935. Our goods and mineral trains make less than 10 miles an hour and carry less than one-sixth of the American train load, which reached the record weight of 1,146 tons in 1947. The average American wagon carried 32.6 tons and travelled 49 miles a day.

Of the 134,000 new wagons on order on May 1, 1948, many of the open and hopper types have a capacity of 70 tons; the capacity of covered wagons is 50 tons as a rule, though most refrigerators are built to hold 40 tons. The quality of these large wagons is also improving. For instance, when the Union-Pacific started a livestock service between Utah and Los Angeles on a 30-hour schedule for the 821 miles run, it provided wagons equipped with roller bearings, special brakes and bolster scrubbers, and aluminium painted to reflect the heat and reduce the inside temperature. In contrast to these policies, the failure of the British railways to extend the use of 20-ton wagons is decidedly odd.

In seeking to improve their services, the U.S.A. railways have one great advantage over our nationalised system. There is no restriction on capital expenditure. Last year the American railways spent \$566 million on equipment and

\$299 million on permanent way and structures: of the latter sum, over \$44 million was expended on heavier rail alone. Expenditure of about twice these amounts is said to be authorised in 1948, but the shrinking of net revenue may call a halt. The companies would like the Interstate Commerce Commission to fix charges which would yield a return of 6 per cent. on net investment, but the regulating body has kept well below that mark in its latest award.

Future railway prospects seem to depend mainly on the trend of industrial development in the States during the second half of this year, when traffics are ordinarily heavier than in the first six months. Much the same remark might be made about British Railways, but unfortunately our statistics do not show the steady improvement in operating efficiency which Dr. J. H. Parmelee's annual review of American railway operations has made manifest over a long period of years. We are indebted to the latest issue of his review, with figures revised to April, 1948, and to the "Freight Progress Number" of the *Railway Age*, published on May 15, for much of the information on which this article is based.

Operating Costs of Heavy Shunting Locomotives on Industrial Railways

THE use of small diesel locomotives for light works shunting is now fairly well established as economically advantageous. Where loads commensurate with those of main-line trains have to be dealt with, there is, as yet, very limited experience to guide commercial users in this country. The former railway companies, particularly the L.M.S.R., took a commendable lead in the use of diesel shunting locomotives of 300 h.p. and over, but the conditions in industrial service differ sufficiently from those in railway yards to justify, perhaps, the hesitation shown in this field in following the railways' lead.

The iron and steel industry is an outstanding example of the large-scale user of heavy shunting locomotives, and a meeting of the Engineers' Group of the Iron & Steel Institute two years ago, showed that a good deal of rather inconclusive discussion was going on in the industry as to whether any advantage would be gained by changing from steam to diesel locomotives. Indeed, it may well be that the extensive use of large diesel-electric locomotives in American steel works was largely responsible for some uneasiness as to whether British practice was not behind the times in this respect.

In the May issue of the *Journal of the Iron & Steel Institute*, an authoritative report on the subject issued by the British Iron & Steel Research Association will be of considerable interest to all commercial users of heavy shunting locomotives, because it presents details of operating costs on a really broad basis, free from any suspicion of bias. The report, which was prepared for the Association by its Mechanical Engineer, Mr. E. L. Diamond, analyses the costs of locomotive operation at a number of works representative of widely differing conditions. The firms themselves, like the railways, generally reckon the costs as so much per locomotive-hour, inclusive of wages, fuel, and maintenance, and it is, perhaps, no wonder that there has been uncertainty on the matter in the industry when it is realised that the cost of locomotive operation on this basis varied between 14s. and 19s. 5d., exclusive of interest and depreciation, at different works.

Mr. Diamond has brought these apparently inconsistent figures into focus, however, by estimating the total tonnage of materials handled per hour by the locomotives at each works. Expressed as the cost per ton of traffic, they vary from 5.7d. to 9.9d., and the surprising fact emerges that the works with the lowest hourly cost showed the highest tonnage cost and vice versa. This reversal of trend put the figures on a rational basis, because it was found that low hourly costs were associated with old works with poor track layouts and other restrictions, and were, therefore, the result not of more efficient operation, but of doing less useful work. The conclusion is drawn that there is far more scope for the reduction of the cost of locomotive haulage in steel works by proper consideration of track layout and rolling stock design than by changing to other types of locomotive.

In new works, however, these conditions may be assumed to

be favourable, and an estimate of the comparative hourly costs of steam and diesel locomotives in such works has been made. For this purpose, the Iron & Steel Research Association was indebted to Mr. H. G. Ivatt, Chief Mechanical Engineer, who supplied details of the current costs of operation of the large diesel-electric shunting locomotives on the former L.M.S.R. system. The comparison is affected by the fact that in steel works no saving in wages would be made, the firemen on the steam locomotives being, in fact, shunters for most of the time, and also because the item for "services" is much lower in works practice, as these need only be of the simplest.

Taking these factors into account, Mr. Diamond estimates the hourly cost of steam locomotives of suitable size for new steel works as 18s. 2d., inclusive of interest and depreciation, and the corresponding figures for diesel-electric and diesel-mechanical locomotives as 17s. 2d. and 16s. 3d. respectively. The estimated saving in favour of diesel locomotives on an hourly basis is scarcely decisive, and attention is, therefore, directed to the question of how much extra tonnage per hour can be handled by diesels.

By plotting the cost per ton of the two types of locomotive against tonnage handled per locomotive-hour, it is shown that no appreciable saving can reasonably be counted on by the substitution of a diesel locomotive on an existing duty in which the hourly tonnage handled is 30 or less, if the existing arrangements are such that the locomotive has to work intermittently as the process requires and can refuel during periods of waiting. If, however, the work is continuous and is discharged purely at the locomotive's rate as distinct from the process rate, then the saving consequent on handling 20 per cent. increased tonnage per hour by the diesels would amount to the difference between 7·2 and 5·9d. per ton, or 18 per cent. In this comparison it is assumed, of course, that the locomotives are of equal power and haul the same loads.

Close attention is paid in the report to the question of the power required for diesel locomotives for heavy steel works duties. Mistakes have been made repeatedly in the past, because it has been overlooked that the power output of a diesel is more or less constant, whereas that of a steam locomotive rises with the speed. It is common practice in heavy industrial use for steam locomotives to be made to surmount short gradients with heavy loads by rushing them at the highest speed they can attain and thus to maintain a good average speed. Mr. Diamond points out that in these circumstances the boiler acts as a steam or energy storage, and he makes use of the method of calculating the power of the engine put forward in his paper of February, 1947, to the Institution of Mechanical Engineers to plot a series of curves showing the remarkably high horsepowers which can be exerted by comparatively small shunting locomotives in these conditions.

A 0-6-0 locomotive with 4-ft. wheels and 18-in. \times 26-in. cylinders, for example, can develop for a short spell up to 600 h.p. at the rim of the driving wheels at 20-25 m.p.h. by running in full gear and allowing steam pressure to drop from 170 to 150 lb. per sq. in. It is not difficult to understand, therefore, why diesel shunters of 200 h.p. or less have sometimes proved hopelessly sluggish when tried on heavy industrial duties. The report recommends that for general steel works use, diesel locomotives should have a standard power of 350 h.p., with additional standard sizes having horsepowers of 150 and 700 respectively, for light duties such as furnace stage work, and extra heavy duties such as ramp haulage.

The maintenance of diesel locomotives would appear to be viewed sometimes with apprehension, judging by the Iron & Steel Institute discussion. It is pointed out in the report that the overhauling of diesel locomotives is, in general, by the replacement of worn parts rather than their repair, but the permissible limits of wear are much finer than on steam locomotives. If these are exceeded, serious damage to the engine and heavy repair costs may ensue. It is, therefore, necessary to observe a strict routine of inspection and cleaning of oil and air filters, and to train the engineering staff to make the accurate measurements and tests required. Apart from this, work outside the capacity of an ordinary steel works engineering shop, such as the grinding of crankpins, need occur only occasionally, and can be provided for by carrying a few additional major spare parts.

It will be seen that the conclusions of this exhaustive report

do not favour steam or diesel outright, but show that an economic advantage can be obtained from large diesel locomotives in industrial service, provided their operation and servicing is planned and supervised with proper understanding. This comparatively narrow advantage may, of course, be appreciably affected by alterations in the price of large diesels, especially as the result of standardisation, or of fuel oil, but the value of the report will not be affected thereby, because due allowance can be made for such changes in any individual case.

Italian Railway Reconstruction Progress

A FURTHER investment of 200,000 million lire will be required to complete the Italian State Railways reconstruction programme by 1949, according to a recent official statement. Progress made in 1947 is summarised below:

	January 1, 1947	January 1, 1948
Lines in operation :—		
Total length	9,635 miles	9,794 miles
Electrified	2,673½ miles	2,887 miles
Equipment in service :—		
Steam locomotives	2,299	2,263
Electric locomotives	1,047	1,128
Diesel railcars	181	241
Passenger coaches	1,955	2,088
Baggage and mail cars	1,046	2,006
Goods wagons	87,983	103,269

Bridges rebuilt by the State Railways included the Desenzano viaduct, and the Mincio bridge on the Milan-Venice line; the Revere bridge over the Po between Verona and Bologna; and the Pontelagoscuro bridge lower down the river between Bologna and Venice. Structures have been designed to carry heavier vehicles than those they replaced. All double-track tunnels have been rebuilt, although eight still await final repairs. Another big item in the reconstruction programme is housing of railway staff; during 1947 work was begun on 3,331 building projects, which will provide 5,500 flats, with 26,000 rooms.

Electrification during the year has included the conversion of 400 km. of line, in addition to the doubling of the electric track between Naples and Battipaglia. Transformer stations at Gallarate, Arona, and Vogogna on the Milan-Domodossola line have been rebuilt. The Nord Milano Railway also went ahead with an electrification programme. Electrification of the Milan-Canzo-Asso line has been completed and work has been started on the conversion of the Saronno-Laveno and Malnate-Grandate lines.

Modernisation of signalling equipment has been begun on the Milan-Rome-Naples line (via Bologna and Florence), on which the electric trains can communicate with stations by radio telephone. Considerable progress has been made in repair of telegraph and telephone cables on lines between Pisa and Rome, Bologna and Orte, and Naples and Reggio Calabria; on the Genoa-La Spezia and Turin-Bussoleno lines cables are being completely replaced.

An order for 150 diesel railcars with Wilson change-speed gear, each 295 ft. 3 in. long, has been placed with the Società Italiana Ernesto Breda. Use of these railcars has been found particularly advantageous on local lines; the Milan-Mantova trip, for example, has been cut from 6 hr. to 3½ hr. The same firm is also building another type of diesel railcar with the traction machinery placed beneath the floor, this design permitting larger seating accommodation and communication between cars when coupled together. Each railcar is fitted with two 600-hp., horizontal-cylinder, diesel engines; five coupled together can attain a speed of 68 m.p.h. The Fiat streamline diesel train exhibited at the New York World's Fair was given several trials on the Turin-Milan-Venice line, but has since been withdrawn.

Freight traffic has revived more rapidly than passenger. This is put down partly to the competition from road transport, which is able to provide more frequent passenger services at lower prices. To take two examples, the second class railway fare from Milan to Rome of 3,000 lire compares with a bus fare of 2,500 lire; and from eight or nine buses leave Milan for Genoa daily against only four express trains. The Italian Ministry of Transport recently attempted to remedy this situation by the simple expedient of decreeing a reduction in bus services, against which bus and tourist interests have, not unnaturally, protested. One point put forward was that no step should be taken which might impede tourist traffic in 1950.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

British Railways Summer Timetables

St. John's College,
Oxford. June 12

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR.—One must agree with your editorial article of June 11, that services to Sheffield are still far too slow. You point out that the new 4.50 from Marylebone is only fractionally faster than the 4.50 from St. Pancras, but not that this train loses no less than 15 minutes through running via Chesterfield, where the E.R. cannot hope to compete; similarly the stop at Aylesbury adds to the running time and turns this train into a suburban service. Thus the opportunity of a really fast service has been lost.

In the up direction, too, the fact remains that in the October 5, 1946, timetables the 10.0 a.m. from Bradford reached Marylebone at 3.0 p.m., while the much-heralded "South Yorkshireman" does not arrive till 3.15, and later still on Saturdays.

Yours faithfully,
R. G. OAKLEY

Livery of British Railways

70, Church Street,
Woking, Surrey. June 16

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—I was interested to notice on page 662 of your June 4 issue a writer diligently engaged in completing "British Railways" on the tender of express passenger engine No. 45565. This brings to my mind that the other evening I was waiting on a main-line station on the old Southern Railway when an express went through with "British Railways" written on it. I was very surprised, as I had expected to see a German train, and I was quite surprised that it was, in fact, a train!

All joking apart, can anyone enlighten me as to why it is necessary to put this label all over our trains. Would it not have been better to have coded the trains in their regions, in which case the Southern "S.R." could have remained. Surely it is an insult to the intelligence of the general public to inform them that it is a "British Railways" train that is passing by them.

Perhaps you would be so good as to publish this letter, from which I am hoping to get some enlightenment.

Yours faithfully,
P. W. RAYNER

Are Locomotive Designers Conservative?

The Superheater Co. Ltd.,
53, Haymarket, London, S.W.1. June 14

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR.—With reference to the letter which appeared in your issue of June 11 headed "Are Locomotive Designers Conservative?" your correspondent states that it would be interesting to learn how many superheaters with multiple-valve regulators have been supplied by the Superheater Company.

To date, the number of these heaters supplied and on order is 3,239, of which only six were supplied to the L.N.E.R.

Yours faithfully,
ERIC A. ROBINSON,
Managing Director

Shatrick, Broadway,
Ilminster, Somerset. June 14

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—I think Mr. Cameron is a bold man to give the reasons in his letter, in your issue of June 11, which led to the attaching of pads to back-plates of new boilers by means of counter-sunk patch studs. I adhere to my view that it was a bad job.

The letter from "One of the Designers" in the same issue is interesting in many ways. I hope it will cause humorous comment, as a laugh is worth a lot. I agree that it is no good designers producing improved designs if the chief mechanical engineers of railways will not accept them, but that does not necessarily prove that their ideas are bad.

The remarks regarding superheaters in the fourth paragraph of the letter seem to indicate that ideas are not acceptable on British railways even when proven on railways elsewhere.

No doubt "One of the Designers" has read the discussion which followed Mr. Bulleid's paper on the "Merchant Navy" class locomotive. If not, I think that Mr. P. C. Dewhurst's contribution will interest him, as showing how well established steel fireboxes and welded-in tubes were on certain South American railways before they were tried out on British railways.

The remarks on bankers and research are illuminating. It would appear that bankers elsewhere (Swiss bankers, for instance) are not infected with the dislike for research. This line of country could be expanded either by the writer of the letter or myself considerably, as it has a bearing on the way that designers in this country are cribbed, cabined, and confined. It is for managing directors of contract shops to convert the banker so that their staffs can produce improved designs. I fear, however, that managing directors and boards of directors live for the present, and they will live to regret it.

One can liken the present-day locomotive to a hat-rack on which are hung a series of hats which take the form of proprietary makes of injector, sander, superheater, roller bearing, etc. Year by year the sum total of the hats forms a greater fraction of the value of the locomotive.

We have now reached a period where the diesel-electric locomotive and the gas turbine are a pressing danger to the steam locomotive. Soon the hat-rack will shrink till it becomes the frame, wheels, cab, and brake rigging, and the glory will depart from the contract locomotive shops.

I admit that the chief asset of the big locomotive builders is the conservatism of the C.M.E.s plus the bankers' dislike for research. This, possibly, is why directors do not go against the banker, who also deals with the accounts of railway companies.

If by nationalising the railways, research into locomotive design and construction is facilitated, then, although an individualist, I should feel well disposed towards it. I grieve for designers with initiative who are not allowed to develop their ideas.

Yours faithfully,
KYRLE W. WILLANS

Train Services from London to the Midlands and Yorkshire

"Merok," 22, Barnhill Road,
Wembley Park, Middlesex. June 1

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—I should like to thank Mr. George Dow for his informative reply in your May 7 issue to my criticisms of the train services provided between the Midlands and Yorkshire via Penistone and the former Great Central line; also those from Marylebone to the Midlands, to which I referred in an earlier letter. The improvements introduced with the new summer timetable certainly have effected a considerable expansion of the facilities provided over these routes and, in particular, the restoration of a through service to Bradford via the Penistone line, which will, one imagines, be much appreciated by travellers from the places now served by the "South Yorkshireman" as the new train has been happily named. The good connection now given by the 1.35 p.m. from Bradford with the reinstated 2.20 p.m. Manchester to Marylebone express at Penistone gives a greatly improved service to Sheffield and the South, and it seems a little unfortunate that a stirring up of other existing unhurried connections at Penistone has not been possible to back up these encouraging developments.

Turning to the Great Central main line proper, it is pleasing to note the more ample service now provided by the introduction of the "South Yorkshireman," and the replacement of the former 9.55 a.m. Manchester to Marylebone train by the new and considerably quicker 2.20 p.m. train. Whilst one hopes that these new services will encourage sufficient public patronage to become permanent, it does seem questionable whether the trains have been run at times most likely to appeal to the travelling public, by comparison with services already running over parallel routes. The new 4.50 p.m. from Marylebone, for example, leaves London at precisely the same time as an existing express from St. Pancras serving Nottingham, Chesterfield, Sheffield and Bradford, so that the new train gives little service improvement to travellers to and from these important places.

Similarly, the reinstated 2.20 p.m. from Manchester to Marylebone gives a service from Sheffield and Leicester at almost exactly the same times as the existing Midland Division express leaving Sheffield for London at 3.42 p.m. The lack of appeal for London traffic is apparently borne out by the very poor patronage, at the London end of the journey at any rate, on the first two days of working, when the number of passengers alighting from its nine passenger-carrying coaches cannot have much exceeded thirty! Had this train been timed to leave Manchester at about midday, it could have given an entirely new and faster mid-afternoon service between the Midland Division trains which arrive in St. Pancras at 4 p.m. and 6.5 p.m.

Alternatively, a really fast late evening service might have been provided, a lack clearly emphasised by the existing lethar-

gic 4.50 and 5.10 p.m. trains from Sheffield to London by the Midland and Great Central routes respectively, which compare very unfavourably with the fast late evening service from the Midlands to London given by the 5.20 p.m. express from Leeds to London by the Midland route, and the 4.50 p.m. from Bradford by the Great Central route, until these trains were withdrawn early last year.

These criticisms do not apply to the same degree to the up working of the "South Yorkshireman," which does fill up a gap in the service from Sheffield, Nottingham, and Leicester to London, as well as giving the useful new facilities north of Sheffield.

Some of the scheduled timings of the new trains compare unfavourably with those already in operation, the "South Yorkshireman" taking 7 min. more from Rugby to Marylebone than the "Master Cutler" (for a non-stop run) and no less than 19 min. more on Saturdays, when an additional stop at Aylesbury is made. The Aylesbury stop might well be made a profitable daily working feature, without increase in journey time, if a good connection to High Wycombe was arranged, as this line has no through service in the up direction, although the 12.15 p.m. from Marylebone is routed through Wycombe and Risborough.

The 131-min. schedule of the new 2.20 p.m. from Manchester between Leicester and Marylebone is actually 7 min. slower than that of the "Master Cutler," which makes a 2-min. halt at Rugby in addition, and no less than 22 min. slower than pre-war. In fact, with exactly the same stops as in pre-war days, this train is 45 min. slower throughout, of which only 5 min. is taken up by increased station times. Heavy line-occupation over the former Metropolitan & Great Central Joint line does not, from a study of its timetable, appear to preclude earlier running of this train; in fact, on its inaugural trip Neasden was passed 7 min. early!

I trust that these comments may suggest to the responsible authorities the possibility of dovetailing the services given by this route more fully with those already given over parallel routes, to provide the maximum appeal to the travelling public and to ensure the maximum patronage of the new services just introduced and those already in operation. I feel sure that, combined with the still exemplary punctuality of train working on the Great Central Section, such measures would meet with considerable success.

Yours faithfully,

GEORGE W. CARPENTER

Private Ownership of Wagons

Charles Roberts & Co. Ltd.,
Horbury Junction,
nr. Wakefield. June 11

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR.—Unfortunately, at the time you published a letter in your issue of January 9 last above the signature of Mr. E. R. B. Roberts I was indisposed, and it is only now that I have had an opportunity of carefully reading the letter and sending you my reply.

Although, as he points out, I have had no practical experience in operating the railways and their traffics, I have spent over half a century in the wagon-building industry, and that should provide some justification for my venturing to express opinions which, unfortunately, do not coincide with his.

The statement he makes that my views are diametrically

opposed to those of every responsible traffic officer is not in accordance with the facts. I have not seen cases where railway general managers described these wagons as the "bane" and the "curse" of British railways.

I have not forgotten the various Royal Commissions, nor all that they stated from time to time on this wagon question, but, on the other hand, as far back as 1926 I have taken upon myself to make certain representations to the government authorities in London, and I worked out a scheme with the suggestion that the older wagons should be scrapped and replaced with more modern stock.

I suppose Mr. Roberts will admit, even if he has so small an opinion of my ideas, that the coalowners and those responsible for our vast coal industry would be likely to know what type of wagon suited their requirements best, and if the 20-ton wagon has not come into more universal use it may be accepted that it is because those men did not find that type of wagon suitable for their traffic.

It was for that reason that I introduced and pressed forward the introduction of the 16-ton wagon, which happens to have the maximum carrying capacity to meet the requirements of the coal traffic under present conditions. Because the 40-ton special wagons put into traffic by the L.M.S.R. for its Stonebridge Park power station happened to suit that particular traffic is no sound argument, because anyone with any knowledge of railway wagons is quite aware that such vehicles are not suitable for the general coal traffic.

Anyway, the private owners' wagons, for good or evil, have now been transferred to the State, and it remains to be seen what the result will be.

On behalf of this company, I claim that no people in the country have done more, over a period of half a century, to help to improve the rolling stock of this country, especially the private owners' stock, tank wagons, hopper wagons, and coal wagons.

Your correspondent is now at liberty to make his representations to the powers that be and cease to try to put the blame on the private owners, or their wagons, for the state of affairs.

Yours faithfully,

DUNCAN BAILEY

Delays in Timetable Publication

United University Club,
Pall Mall East, S.W.1. June 3

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR.—With nationalisation providing a clean start, British railway management had the opportunity of making a great, and long-needed, reform. For two generations intending travellers have had a legitimate cause of complaint in the fact that when the railway companies altered the train services, it was impossible to procure a *Bradshaw* or any other timetable showing the alterations until many days after they had come into force. We were told that our nationalised railways would introduce their first summer service on May 31, but up to today (June 3) I have been unable to buy either a *Bradshaw* or an *A.B.C.*

No-one expects much from nationalisation except increased charges and reduced facilities, but this is a grievance which could be remedied with very little trouble and without expense, and surely deserves attention.

Yours faithfully,

W. B. THOMPSON

Publications Received

Glossary of Wood, by Thomas Corkhill, M.I.Struct.E., F.B.I.C.C., published by the proprietors of *Wood*, the Nema Press Limited, 33, Tothill Street, S.W.1. 656 pp. 7½ in. × 5 in. Fully illustrated. Price £1 1s.—This remarkable publication explains no fewer than 10,000 terms connected with timber and its uses, about 1,000 of them being illustrated. In fact, there is nothing one can think of which directly or indirectly is associated with wood that is not included in this comprehensive glossary. As well as describing and classifying every kind of timber grown in all countries, its quality, weight and uses are given. Simple and complicated woodworking tools, manufactured articles, furniture, architecture, buildings, and other

structures, railway carriage, and wagon, boat- and ship-building, wood carving, scaffolding, shoring, concrete shuttering, fencing, and their components and fittings are but a few of the many subjects covered.

Excellent line blocks prepared from perspective and working drawings and diagrams provide the numerous illustrations of all kinds of items. There is an interesting introduction by the author and a foreword by the Editor of our associated monthly publication *Wood*. Both of them are to be congratulated on this venture, the only comprehensive work of its kind, and one that should be of practical value to everyone connected with the growth, marketing, and utilisation of timber, and of considerable interest also to a much wider circle of readers.

The Colonel Stephens Railways. By R. W. Kidner. Light Railway Handbooks: No. 1. Third Edition. Godstone, Surrey: The Oakwood Press, Tanglewood. 7 in. × 4½ in. 16 pp. + 7 pp. illustration plates. Stiff paper covers. Price 2s.—This is a short summary of the history and equipment of the five small railways owned and managed by the late Colonel K. F. Stephens—the Kent & East Sussex, the East Kent, and the Shropshire & Montgomeryshire, all now under the control of the Railway Executive; and the Weston, Clevedon & Portishead, and West Sussex (Selsey Tramway), closed in 1940 and 1935 respectively. Particulars given of each railway include a sketch map, dates of opening, and brief notes on the locomotives (with sketches), coaches, track, signalling, livery, and tickets.

The Scrap Heap

THE G.W.R. MAN

A man told the West Middlesex coroner in Ealing that he worked on "the G.W.R."

Coroner: How long have you been on the railway?—Forty years, sir.

And you still say "Great Western Railway"?—I do indeed, sir.—From the "Evening Standard."

OUR RAILWAYS

I have seen electric trains with the inscription "British Railways," in gold letters on green, or white letters on blue. Thus, those who have profited by free education to acquire the art of reading may be assured that these machines belong to us, and have not been smuggled into our railway system by some foreign capitalist.

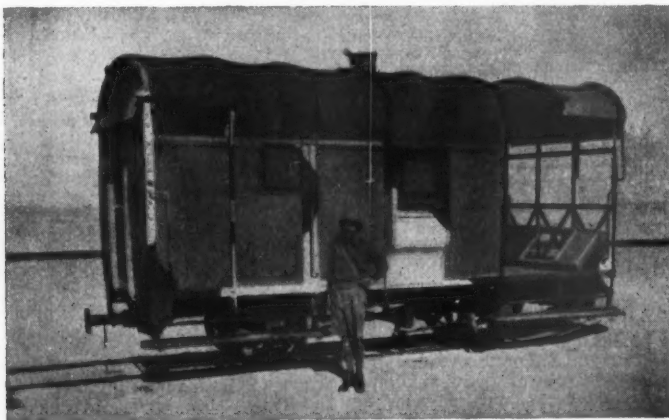
Before the war, railway companies discovered that by omitting the letter R, they were able to effect an economy of many thousand pounds. The more acute among our travellers were aware that they were travelling by railway.

Happily the need for such cheese-paring economies is at an end, and now we shall all know where we are.—Mr. Gerald Yeo in a letter to "The Daily Telegraph."

A PLACE IN THE SUN

On active service and in other unusual circumstances, senior railway officers sometimes have to improvise personal and office accommodation or inspection saloons by the conversion of coaching or goods rolling-stock. In Iraq in 1942, the senior officer of a group of Indian Engineers Railway Construction Companies converted a metre-gauge brake van for use as an inspection saloon; this is shown in the illustration below.

This vehicle had no lights or fans, and its roof and walls were, as usual, of steel sheeting. As the temperature was frequently over 118° in the shade, and sometimes as high as 123°, the interior resembled an inferno, and it is little wonder that the occupant went down with a mild attack of heat exhaustion, so common in that climate. What the temperature in the sun was, is not recorded, but metal exposed to it would certainly blister the hand if touched, so that the vehicle would be closely akin to an oven.



Metre-gauge brake van converted for use as an inspection saloon. (See paragraph above)

WILD LIFE ON THE DISTRICT

Someone kicked a grey, 2 ft. 10 in. long snake out of a District Line train on to the platform at Baron's Court, W., recently. Station foreman Harry Wakefield hit it with a spade on its egg-shaped head and killed it.—From the "Daily Express."

100 YEARS AGO

From THE RAILWAY TIMES, June 24, 1848

GENERAL RAILWAY STATION, SHREWSBURY.

The Committee of the General Railway Station at Shrewsbury are ready to receive TENDERS for the supply of TURN-TABLES, SWITCHES, CROSSINGS, TANKS, &c.

Particulars and forms of tender may be had on applying at the Engineer's Office of the Shrewsbury and Chester Railway, Chester, and of the Shrewsbury and Birmingham, and Shropshire Union Railway Companies, 28, Waterloo-street, Birmingham.

Tenders to be addressed to Mr. J. J. Peele, Guildhall, Shrewsbury, on or before the 4th of July next.

By order of the Committee,

JOHN TUDOR, Secretary.

Shrewsbury, 19th June, 1848.

SHREWSBURY and CHESTER RAILWAY.

FIFTH and FINAL CALL: £2 per Share on the Perpetual Preference £8 per Cent. Stock; making, with the Deposit, £10.—NOTICE is hereby given, that, in pursuance of a Resolution of the Board of Directors, the Proprietors of the above Shares are required to PAY a FINAL CALL of £2 per Share, to either of the under-mentioned Bankers, on or before Saturday, the 15th July next:—

The London Joint Stock Bank, London.
Messrs. Dixons and Wardell, Chester.
The Borough Bank, Liverpool.
Messrs. Wm. Jones Loyds and Co., Manchester.
The National Bank of Scotland, Edinburgh.
The Caledonian Bank, Inverness.

Interest at the rate of 5 per cent. per annum will be charged on all Calls remaining unpaid.

By order,

ROBERT ROY, Secretary.

Chester, June 15, 1848.

TECHNICOLLOUR TRAVEL

The idea that trains and station signboards in a modest set of four colours should send us wild with excitement must make old railwaymen and passengers smile. Before 1923, when the railways were grouped, no fewer than a hundred and twenty companies operated up and down England, Scotland and Wales. "Not to be confused with the rolling stock of any other company" seems to have been the motto of all these sturdy individualists, and they went for colour in a big way. They painted not only coaches and trucks but engines, too, and the more brass they could add in the shape of plaques and scrolls the better. In those gay days we had canary yellow trains and apple green

trains and trains in a fine raging red. We had striped trains and trains with scenes painted on the coaches. . . .

What fun it would be now to step into a peppermint pink train at Victoria and arrive at a Brighton station as gay as its own famous rock. I am one of those rebels who have no use for useful colours at all. Useful colours are a snare and a delusion. Like black stockings, they are unlovely from the beginning and just as dirty in the end. . . .

What piquant inducement to travel coloured trains might offer in the future when travelling becomes a pleasure once more! Those who take their politics with deadly seriousness might be offered journeys on the All Red Route or the True Blue Special. We could have White Trains for bridal couples, Tartan Trains for Scotsmen, a Kelly Green Line for the Irish on their way home via Holyhead. The possibilities are endless, and foreign tourists would go back to their own countries and report that the British had thrown away their sangfroid and gone gay at last. . . .

—Extracted from an article by Alice Hooper Beck in "Housewife."

C.P.R. WHISTLE

The whistle of a C.P.R. locomotive moaning over the prairies must be just about the loneliest sound in the world. Whistle is not the right word though: the noise is a great, gruff, deep-bellied roar, awful in its power yet somehow infinitely sad. Prairies is not the right word either, but it will have to do. Lying there in my little lower berth I could hear the monster calling to the lone rangers, lone trappers, farmers and lumbermen, growling its greeting. I brooded on the primitiveness of life in the wide primeval places, pulled the sheets up round my neck and listened contentedly to the snoring of the Winnipegger just above me.—From "An Innocent in Canada," "Punch."

LIVERY LOOKS

They're out and about—those mannequin trains, So a Railway Executive "hand-out" explains, To give you and me and the next man a voice, In the new looks for locos—so just take your choice. The good folk at Derby and Euston all croon: "You cannot go wrong if you stick to maroon!" And pundits at Paddington smile in their dreams, Content to continue their chocolates and creams. The Cock o' the North dashes fierily through, Self-consciously decked in a soft shade of blue; Way down South it appears, that for years will be seen, Those multiple units in malachite green. Some would boost up morale on a basis so slender, As letters of gold on a black-painted tender. While one famous journal (that's everywhere read) Consistently clamours for Post Office red. New fashions parade on the permanent way; Is there prestige in plum, or in cream, red, and grey? Well—opinions may waver, and policies wilt, But I hope no one cries over milk that is "spilt!"

A. B.

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

SOUTH AFRICA

Eastern Transvaal Improvements

It has been decided to improve the ruling gradient on part of the Eastern Transvaal main line to Lourenço Marques, and also to reduce the standard of curvature in the more difficult sections. The present steep gradients and sharp curves place severe limitations on loads and train speeds over this important line, which carries all export coal traffic from the Witbank and Middelburg coalfields to Lourenço Marques, and also handles heavy traffic in the inland direction.

The existing ruling gradient towards the coast on the Olifantsrivier—Uitkyk and Middelburg—Belfast sections is 1 in 56. It is proposed to reduce this to a new standard of 1 in 100. To avoid the steepest gradients, the new line will follow a longer route, lengthening this portion by about two miles. The deviations will involve heavy earthworks and several high bridges, and the work will take several years to complete.

Cost of Work

The preliminary estimate for regrading the line between Olifantsrivier and Belfast is £1,500,000. In the current year's estimates £500,000 has been set aside for this programme, from loan and betterment funds. The doubling of the line between Oosbank and Olifantsrivier will cost about £125,000, and the current estimates provide an amount of £17,500 to begin the work. Improvements in the marshalling yards at Nelspruit and Komatipoort will have an allocation of £19,500 for this year, the total cost being estimated at £80,000.

On the Pretoria to Machadodorp section, additions and improvements to the station yards at Belfast, Middelburg, Olifantsrivier, Sunbury, and Wonderfontein are estimated to cost £140,000, and deviations on this section, and the re-location of Koedoespoort Station, will cost £244,000. This work has been allocated £35,000 in the current year. Additions and improvements to the marshalling yard at Capital Park will be undertaken at a cost of about £210,000, and in the current financial year £56,000 will be spent.

RHODESIA

Kafue Rail Bridge

Railway engineers recently have been concerned over the rising Kafue River, which has flooded. "Floating islands" of large dimensions are drifting down the river and impinging against the piers of the 13-span rail bridge (1,300 ft. long), where the islands are being broken up by gangs of African labourers, and so far have been disentangled successfully. The bridge is a vital rail link in the route to the copper belt and the Congo.

Railways "Hamstrung"

The Rhodesia Railways have been subjected to criticism since the end of the war, but the tables were turned at a recent meeting of the Central Priorities Advisory Committee, when the General Manager (Sir Arthur Griffin) made—*inter alia*—the following pointed remarks: "We have moved the traffic; we are waiting to move more, but we are hamstrung by lack of co-operation, and held despite appeals to commercial bodies, to the Government, to Government departments, and others."

He estimated that Customs clearance delays were causing a "loss" of 150 wagons a day, and pressed, first, for the immediate removal by the Government of old-date consignments to a bonded warehouse; and secondly he stressed the need for a speeding up of Customs clearance. Railway storage charges have been raised to provide additional incentive to merchants to get their consignments cleared. The committee passed a resolution drawing the attention of the Government to the position.

BURMA

New Locomotives Delivered

During April, the railways received two more Class "ST" 2-6-4 tank locomotives; and three locomotives of this type, together with additional coaching and goods stock, have been shipped across the Gokteik Gorge. This has permitted the service between Nawngpeng and Lashio to be operated daily as from May 1.

Interruptions of Train Services

Increasing risks of danger from acts of sabotage made it necessary to suspend night running of trains on the main line with effect from April 25, although it was hoped that normal services would be resumed very shortly. For the same reasons the service between Lewé and Taungdwingyi was suspended as from April 23.

Advance Booking in Rangoon

A City booking office at which travellers can buy their tickets in advance was opened at the Bogyoke New Market, Rangoon, on April 1.

UNITED STATES

New N. & W.R. \$12 million Tunnel

A short distance west of Bluefield, in West Virginia, the Norfolk & Western Railway is constructing an important 5.2-mile length of double main line. It involves a new double-line tunnel 6,900 ft. long, estimated to cost \$12,000,000. Somewhat more than 10 per cent. of this work has been completed already.

New Equipment for "Hiawatha" Trains

Some 40 new streamline vehicles were placed in service by the Chicago, Milwaukee, St. Paul & Pacific on May 29 on its "Hiawatha" services. All were built in the company's shops at Milwaukee. Among the new vehicles are parlour cars with a glass-enclosed observation lounge, and 48-seat dining cars with stainless-steel kitchens and special refrigerating equipment.

Oil Supply for Diesels

A special sub-committee on petroleum which has been investigating the use of this fuel in relation to national defence, has advocated Government control of steel allocations for railway petrol tank wagons, and of the distribution of oil itself, should the present voluntary conservation measures prove unsuccessful.

In stating that the country is using far more oil now than was consumed before or at the peak of the 1939-45 world war, the sub-committee quoted diesel-electric locomotives among the factors contributing to increased consumption, stating that they could be and were being produced more rapidly than oil wells, pipe-lines, refineries,

and tankers. The report pointed out that the railways were using 42 per cent. more diesel-electric locomotives now than in 1947, and that 92 per cent. of the new locomotives on order were diesel-electrics.

The report stated, however, that much of the evidence confirmed the view that the present oil problem was primarily a steel problem, and that given enough steel for pipelines, tank wagons, tankers, refineries, and so on, the oil shortages could be alleviated promptly.

CANADA

Equipment Orders Completed

During the period from April 19 to May 20, the Canadian Pacific Railway received 326 50-ton steel-sheathed, wood-lined box wagons from the National Steel Car Company, completing an order for 750. Also, the company received 120 50-ton steel-sheathed end-door motorcar vans from the same firm, completing an order for 120; eight "GSD" class locomotives from the Canadian Locomotive Company, bringing to 12 the number received to date (see *The Railway Gazette* of April 23); 59 70-ton triple hopper wagons from the Eastern Car Company, completing an order for 250; and two finished first class coaches from Angus Shops, completing an order for 35.

ARGENTINA

Terminus Renamed "President Peron"

The Special Railway Committee, acting on a suggestion from the National Economic Council, has passed a resolution to the effect that the Retiro Terminus of the Central Argentine line shall be called in future "President Perón," taking into account that the transfer ceremony of the British-owned railways to the State took place there on March 1 last.

Railway and P.O. Telegraph Link-Up

At a recent meeting the Special Railway Committee decided to recommend to the Executive Power that the telegraph system of the recently-acquired railways should be connected to that of the Post Office in order to provide improved service to the public, and also to abolish the extra charge made when the use of two different systems is involved.

Another result of the acquisition by the Government of the former British-owned railways is that all stations now accept public telegrams. Previously these could be handed in only at places not served by the Post Office telegraphs.

NORWAY

Anti-Frost Measures

Due to the geographical situation of this country, considerable difficulty is experienced in maintaining the track, which becomes heaved up by the freezing of the moisture in the formation. The State Railways have had to excavate and remove soil liable to be so affected, and to replace it by materials which do not expand seriously when frozen. Most effective of these has been found to be peat, in the form of pressed blocks, covered with gravel, crushed stone chips, or cinders.

So successful have been the preliminary trials of these materials, that 300 km. of line are to be matted in this way, over 1½ million blocks—each 1 m. by 0.5 m. by 0.3 to 0.5 m. thick—being required for the purpose. The mattress is one block thick and about 4 m. wide, the blocks being laid eight abreast with the longer dimension parallel to the track.

American-Built Locomotives for Belgian Railways

Belgian National Railways have bought 300 2-8-0 locomotives from Canada and the U.S.A. to supplement stocks depleted by the war

TO replenish locomotive stocks depleted by the war from 3,414 to 2,371, of which only 1,008 were fit for service in 1945, the Belgian National Railways (S.N.C.B.) ordered 300 locomotives in America, delivery of which has now begun. The locomotives, designated Class "29," are of a robust, 2-8-0 type and have been found equally suitable for working express passenger trains and heavy freight trains. The maximum speed of the class is 60 m.p.h. under normal working conditions.

The Montreal Locomotive Works built 220 of the class, the remaining 80 being supplied by the American Locomotive Company. The frame of the engine is of the American bar type and the cylinders are in an exterior horizontal position. The driving wheels are 5 ft. 0 in. in

diameter. The main dimensions of the locomotive are as follow:—

Driving wheels, dia. ...	5 ft. 0 in.
Cylinders, dia. ...	22 in.
" stroke ...	28 in.
Boiler pressure ...	200 lb. per sq. in.
Firebox ...	151 sq. ft.
Total evaporative heating surface ...	1,965 sq. ft.
Superheater ...	786 sq. ft.
Total heating surface ...	2,751 sq. ft.
Grate area ...	47 sq. ft.
Tractive effort ...	33,115 lb.
Total wheelbase ...	56 ft. 0½ in.
Weight on—	
Leading axle ...	13 tons 15 cwt.
Each driving axle ...	19 tons 13½ cwt.
Maximum total weight in working order—	
Engine ...	92 tons 10 cwt.
Tender ...	56 tons 14 cwt.

The boiler is fed by a live steam injector or by a centrifugal steam feed pump which

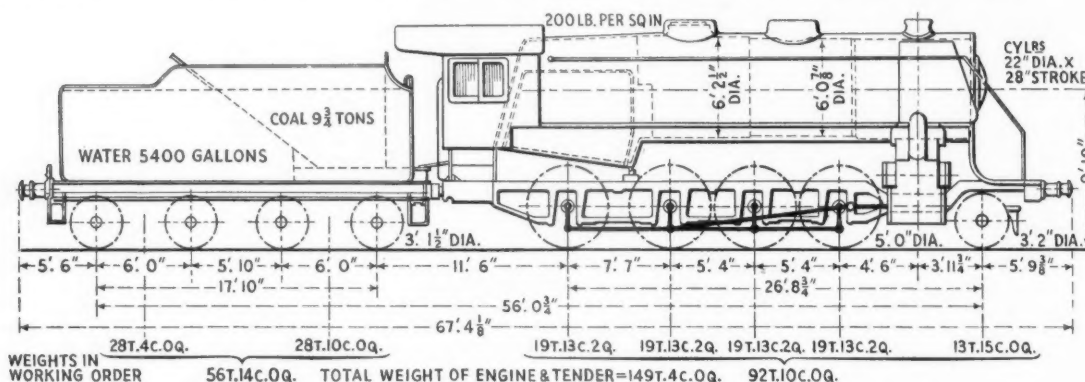
delivers water from the tender into a Worthington feedwater heater. The heated water is injected into the boiler by a piston pump.

The boiler tubes comprise: 152, of internal dia. 1½ in. (external 2 in.); 48, of internal dia. 5½ in. (5½ in.); and 3, of internal dia. 2½ in. (3 in.). The height to the centre line of the boiler is 9 ft. 10 in.

The firedoor is controlled automatically by a pneumatic servomotor, which the driver can operate by means of a pedal. The air brake pump is on the right-hand footplate and is protected against the cold by a metal screen. Current for the complete electric lighting system is generated by a 24-volt turbo-alternator.

The tender has a water capacity of 5,400 gal. and a coal capacity of 9½ tons. The wheelbase is 17 ft. 10 in. and the wheel diameter 3 ft. 1½ in. The weight empty is 27 tons 9½ cwt.

The class is designed for working over maximum gradients of 1 in 40 and curves of radius not less than 5 ch.



Drawing showing main dimensions of the locomotives purchased by the S.N.C.B.

Flame-Cleaning Steelwork before Painting

The advantages of removing scale and other deposits from steelwork by oxy-acetylene flame before painting reported to the American Railway Engineering Association

THE Maintenance of Way Work Equipment Committee of the American Railway Engineering Association recently appointed a sub-committee under the chairmanship of Mr. T. M. Pitman, Division Engineer, Illinois Central Railroad, to report on flame-cleaning railway structures preparatory to painting. Its report was presented at the recent convention of the A.R.E.A. The following are some of the cardinal points of the report.

Economy Effectuated

Flame-cleaning is now proving more economical than sand-blasting, especially for jobs out on line, as the plant necessary for the former can be handled and transported much more easily than the heavy compressors and sand needed for sand-blasting. Moreover, the risk of sand dust being blown on to surfaces already cleaned is eliminated. A considerable saving in time also is effected.

The primary condition for effective cleaning of steelwork by this method is quick and intense heat, ensuring that scale and other surface material shall expand rapidly as opposed to the parent material, and separate from it. A slow heat causes fusion instead of separation. An oxy-acetylene flame is generally used.

It is recommended that painting should follow flame-cleaning as closely as possible so that the metal does not cool off and gather moisture and rust. After flame-cleaning, the surface material not blown away by the torch is left dry and can be removed easily with a power-driven wire brush.

The most effective types of cleaning head or torch are flat and about 4 in. in length, though heads of from 2 in. to 8 in. are in general use, the shorter ones being necessary for cleaning in confined spaces. The head should be fitted with skids of specially hard and heat-resisting alloys, such as Stellite, to ensure that the flame is kept at a uniform distance from the surface being cleaned, a condition of considerable importance. It has been found that a flame directed on to the metal at an angle of about 60 deg. gives the best results. The heads are attached usually to standard welding apparatus with extension arms.

The Canadian National Railways have used flame-cleaning extensively preparatory to painting bridge steelwork since 1941. They have found that on large jobs such as the Chaudière River Bridge—a single-line deck-girder structure consisting of 10 spans, each 99 ft. in length—the sav-

ing in time as compared with hand-chipping and scraping, or with sand-blasting, amounts to about 43 per cent, and 33 per cent, respectively. On smaller jobs, such as an 85-ft. half-through type turntable, the saving is approximately 82 and 70 per cent, respectively.

Moreover, it is estimated that the application of paint to warm surface after flame-cleaning secures a saving of about 20 per cent. in the quantity of paint required, an important consideration in respect of a large work such as the Chaudière Bridge painting.

The Pitman sub-committee's report is summarised in *Railway Engineering & Maintenance* "with the thought of advancing the knowledge of this practice," an idea we cordially endorse.

COPENHAGEN EXHIBITION.—It is estimated that some 1,000 firms will be represented at the British Exhibition to be held at Copenhagen from September 18 to October 3. This will be the largest display of British goods ever held in Scandinavia, and, though the area allotted covers more than 100,000 sq. ft., it has not been possible to meet all claims on space. The exhibition is being organised by the British Import Union in collaboration with the Federation of British Industries and with the approval of the Governments of the countries concerned. The engineering display will include a joint exhibit by the gauge and tool industry.

Weekend Works in the Severn Tunnel

Inspection, repairs, and maintenance in the longest main-line tunnel on British Railways

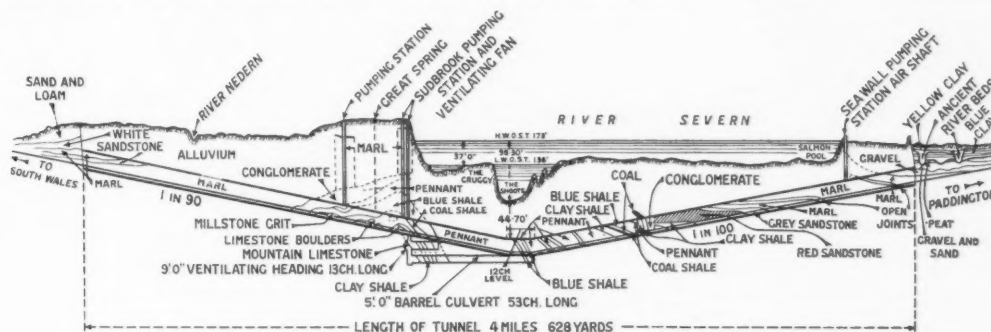
CONSTRUCTED at a cost of nearly £2,000,000, the Severn Tunnel, and its approach railways, materially shortened the original circuitous route from London to South Wales, via Gloucester, and provided direct and unbroken railway communication between Bristol and the Welsh coalfield. The tunnel is 4 miles 628 yd. long, and is the longest tunnel on a British main-line railway, and the longest subaqueous tunnel in the world. The funnel-shaped estuary of the Severn produces exceptionally high spring tides, with a range of nearly 40 ft. at the site chosen for the tunnel. At high tide, 2½ miles of the tunnel are under water, but at low tide, a wide expanse of rocks is left uncovered, and the main stream of the river flows through a channel 55 ft. deep at l.w.o.s.t., but little more than ¼ mile wide, known

Twelve chains of level track separate this falling gradient from the rise, at 1 in 90, to the western (Monmouthshire) end of the tunnel. Since the lowest point is within ½ mile of the western bank of the river, nearly 1½ miles of the tunnel are under the land on the Monmouthshire side. From the eastern portal, the tunnel is straight for about 2½ miles. It then curves to the left for ½ mile, on a radius of 120 ch., and becomes straight again to the western end.

The tunnel carries a double line of railway, and is lined and inverted throughout its length. The maximum width, at 7 ft. above rail level, is 26 ft., and the headway in the centre is 20 ft. The thickness of the brickwork in the walls and roof varies from 2 ft. 3 in. to 3 ft., and in the invert from 1 ft. 6 in. to 3 ft., according

The Severn Tunnel Railway was authorised on June 27, 1872. To compensate the Great Western Railway for the cost of construction, and the loss in revenue (due to the shortening of the route to South Wales) a clause in the Act allowed the 7 miles from Pilning to Severn Tunnel Junction to be reckoned as 12 miles. The preliminary work of exploring the strata, by driving headings under the river, was begun in March, 1873, but progress was far from rapid. At that time, it was thought that the critical section, in which an irruption of water from the river was to be feared, lay under the Shoots, but this proved not to be the case. Indeed, relatively little trouble was experienced from the Severn. The very serious flooding, which twice submerged part of the works, came from an underground river (now known as the Great Spring) the presence of which was unsuspected. The fissure through which this stream flowed cuts across the line of the tunnel, about ½ mile inland from the west bank of the Severn.

The first inundation from the Great



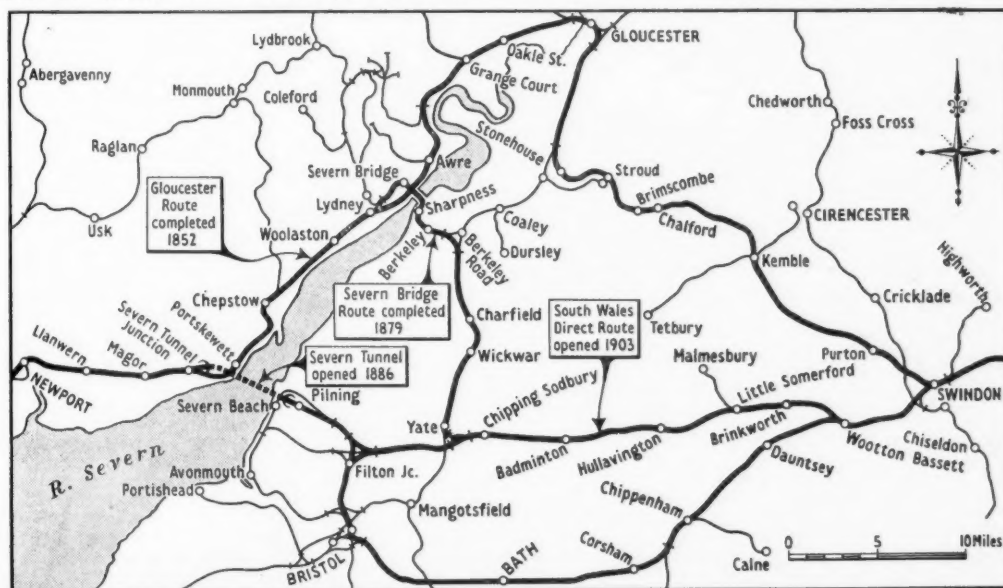
Longitudinal section of the Severn Tunnel

as the Shoots, some 1½ miles from the eastern (Gloucestershire) bank.

The eastern end of the tunnel is situated about ½ mile from the river bank, and the gradient thence to the lowest point, under the Shoots, is 1 in 100.

to the strata. The tunnel passes almost wholly through the trias formations and coal measures, but gravel was encountered near the eastern end. At the lowest point, the crown of the tunnel is 45 ft. below the bed of the river.

Spring occurred on October 16, 1879, when the headings driven from both sides of the estuary were within 130 yd. of each other. Despite this serious mishap, it was decided to proceed with the construction of the tunnel, and Sir John Hawkshaw, who up

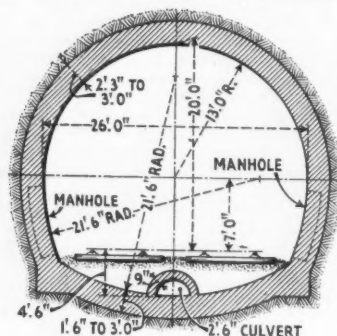


The Severn Tunnel in relation to alternative routes to South Wales

to that time had acted as Consulting Engineer, was given full charge of the works. By the middle of December, 1879, a contract had been signed with T. A. Walker, who had been associated with Sir John Hawkshaw in the extension of the East London Railway under the London Docks.

Twelve months elapsed before the works were clear of water, and such were the subsequent difficulties encountered that it was not until April 18, 1885, that the last length of brickwork was completed. The most serious setback was a second inunda-

tion from the Great Spring, on October 10, 1883, and the opening of the tunnel was delayed for the completion of additional pumps, to deal with this water. Goods trains began to use the railway on September 1, 1886, and passenger services were inaugurated on December 1.



Cross-section of the tunnel

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Ventilation and Drainage

Of the five working shafts used during the construction of the tunnel, those at Sea Wall, on the Gloucestershire side,

mile of tunnel on each side of the shaft in some five minutes. Beyond this, the rate of clearance is slower, and depends on weather conditions outside, and on the frequency of the trains, but the amount of smoke constantly in the tunnel has been reduced considerably. Ventilation is assisted by a 9 ft. dia. abandoned brick-lined heading, which runs below the main tunnel for 13 ch., at the lowest point.

The drainage of the tunnel is a vital problem, calling for special arrangements. The water from the Great Spring is intercepted before it reaches the tunnel, and is led through a brick-lined culvert to a well shaft at Sudbrook, whence it is pumped to the surface, and discharged into the Severn. The amount of water from this source varies, but the daily average is seldom less than 20 million gallons. A 2 ft. 6 in. invert culvert collects water entering the tunnel from the cuttings at each end, and by percolation through the brickwork. This culvert is connected to well shafts and pumps at the Sea Wall shaft, at Sudbrook, and at "5 miles 4 ch." The last-named shaft is situated some 1½ miles from the western end of the tunnel, and derives its distinctly confusing name from the fact that its position is measured from the point on the Gloucestershire side of the river at which the contract for the construction of the tunnel started. The middle section of the culvert, which deals solely with water percolating through the brickwork, is connected with a 5-ft. dia. brick-lined barrel drain, nearly ¼ mile long, which runs from the lowest point in the tunnel to a pumping shaft at Sudbrook.

The plant at the main pumping station, at Sudbrook, consists of ten pumps, with a maximum piston diameter of 6 ft. 3 in. and a 10-ft. stroke. The smaller pumping stations, at Sea Wall and "5 miles 4 ch.," each have two pumps, with a 5 ft. 5 in. piston and a 9 ft. stroke. All the pumps were supplied by Harvey & Co. of Hayle,

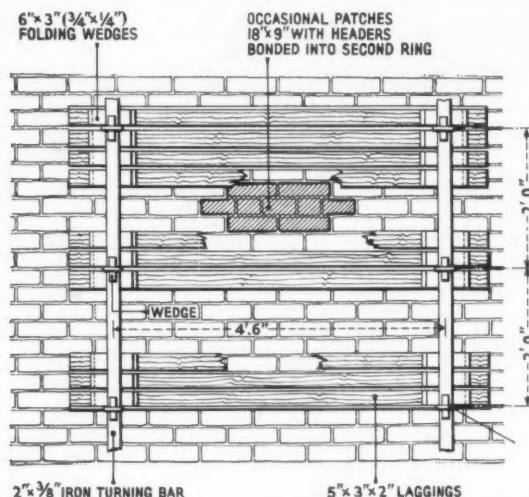
shaft, and for about one-half of the gradient on the Monmouthshire side. At points, where considerable quantities of water percolate through the walls and roof, a hole is cut in the brickwork, and a 1½-in. pipe inserted. Voids around the pipe are caulked and water is led in the pipe to the formation, and thence to the culvert.

On one occasion, serious leakage occurred near the Sea Wall shaft, through a cleft in the strata. The cleft was filled with cement in bags, dropped in at low tide, and a considerable area round the top of the cleft was covered with cement concrete. This mound of concrete, which is known as the "Mushroom," is examined yearly, and maintained as required. Serious leakage occurred in this section of the tunnel in 1929, and was overcome by lining the walls and roof with cement, for a distance of over a mile from the eastern end. Similar measures were taken at the ventilating shaft at Sudbrook. The cost of these works was £82,000.

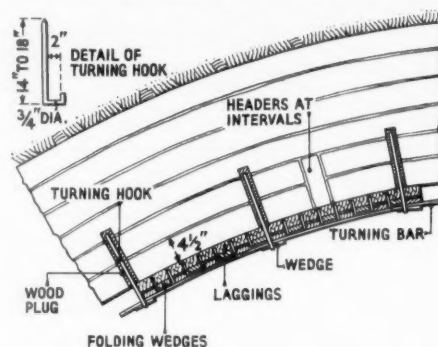
Inspection and Repairs

The inspection and maintenance of the tunnel is a major item on the Divisional Engineer's programme. For a period of several weeks in every year, absolute occupation of both tracks is granted on Sundays, between 6 a.m. and 5 p.m. During this period, local traffic is diverted via the Severn Bridge (at Lydney), and main-line traffic via Gloucester.

On the first Sunday of the period, the brickwork is examined thoroughly, as far down as the springing. The side walls are inspected subsequently. The brickwork is struck with hammers, at intervals of about one sq. yd., and any areas that sound "drummy," or in which scaling has developed, are noted. Particular attention is paid to the pipes that lead water down to the formation. The length of tunnel necessitates the use of two inspection trains, which move forward side by side. Each



Method of repairing areas of defective brickwork



and Sudbrook, on the Monmouthshire side, have been retained for ventilation. The draught through the tunnel is increased by a fan in the Sudbrook shaft. For many years, a suction fan gave satisfactory results, but the continued increase in the weight and number of trains made conditions progressively worse. In 1924, an induction fan, 27 ft. dia., and driven at 60 r.p.m. by an 800 h.p. steam engine, was installed. This fan can clear one

Cornwall. The total daily capacity of the whole installation is 60 million gallons, and the average quantity of water pumped is 20 million gallons. The staff at the pumping stations is under the supervision of the Chief Mechanical Engineer.

Much of the tunnel is completely dry, although the section under the Shoots is under a 170-ft. head of water at high tide. Water in controllable quantities percolates through the brickwork near the Sea Wall

train is composed of a locomotive, a passenger coach, a goods brake van, and the tunnel inspection van. In November, 1947, diesel engines were used for the first time to haul the inspection trains.

On the second Sunday, preparations are made to renew the areas of defective brickwork in the roof. Holes are bored in the brickwork with a compressed air tool, to a depth of about 10 in., and plugged with wood, and wrought-iron hooks, 14 in. to

18 in. long, are driven into the plugs. The hooks are spaced about 4 ft. 6 in. apart along the length of the tunnel, and about 2 ft. apart across its width. Sufficient hooks are fixed to allow three gangs of bricklayers to work. The hooks support 2 in. \times $\frac{1}{2}$ in. wrought-iron turning bars, on which the laggings rest.

The area of defective brickwork is lagged and wedged, except for a strip about 18 in. wide, from which the old bricks are cut out, and the new work built in, until solid brickwork is reached. At intervals of 4 ft. centres, an area of the second ring of brickwork is removed, to provide a key

bull-head rails weighing 97½ lb. a yard, and chairs of the special tunnel pattern, with thickened seats, secured to the sleepers by two through bolts. The standard sleeper spacing is 26 per 60-ft. rail, although experimental lengths with 30 sleepers per rail length are still in use, but will not be repeated.

Rail corrosion is heavy, particularly in wet places in the tunnel, and the average track life is rather less than three years. About 1½ miles of complete relaying, and 1¼ miles of re-railing, are undertaken each year. Materials for relaying are received at Pilning, and specially examined. The

carried out by three gangs of eight men, under the supervision of a district permanent way inspector. The men are issued with special clothing, and receive extra pay for working in the tunnel. The three gangers, accompanied by a lengthman, walk their lengths twice daily. As a safety precaution, a "tell-tale wire" is provided on the wall of the tunnel, on the up side. If the length gangs become aware of any circumstance affecting the safety of trains, or if a train should be brought to a standstill in the tunnel, this wire must be broken.

The cutting of the wire breaks down an electric circuit, and gives warning in the signalboxes at each end of the tunnel. All signals are then placed at danger, and no train may enter the tunnel until the cause of the alarm is known, and any fault rectified. In addition to the emergency wire, eight telephones are provided, in manholes on the down side of the tunnel, to enable the length gangs to communicate with the signalman. The telephone instruments are illuminated by oil lamps. A supply of rails is kept in the tunnel, at convenient points, for use in an emergency.

Restricted Visibility

At the present time, the tunnel is used by some 150 trains every weekday. Even with the forced draught, visibility is severely restricted, and becomes nil immediately after a double-headed goods train has passed on the rising gradients. It is an invariable rule that men must always walk through the tunnel at least in pairs. Manholes are provided in both side walls, at staggered intervals of 1 ch., and it is possible to stand clear of a train against the side walls, except on two short lengths, near the western end of the tunnel, which are marked specially.

Under such conditions, the question of adequate and dependable illumination is of the utmost importance. Oil-pressure lamps are used extensively, but have by no means superseded the open-flame type. Not only is an open-flame type less liable to sudden failure, but the movement of the flame gives adequate warning of the approach of a train, before it can be heard.

The railway block telegraph cables are carried through the tunnel on the down sidewall. Also, the Post Office has a wayleave for telephone lines between South Wales and certain parts of England. The telephone cables enter the tunnel at the eastern portal, but are brought to the surface, on the Monmouthshire side of the estuary, through the pumping shaft at Sudbrook. They are maintained by the Post Office engineers, who have access to the tunnel, under the supervision of the railway staff.



The tunnel inspection gang carrying out an examination of the roof

into the existing work. When large areas have to be renewed, it is usual to deal with alternate length of 4 ft. 6 in. On an average, 9 or 10 sq. yd. of brickwork are removed and rebuilt during a Sunday occupation, and some 6 sq. yd. of the side walls are reconditioned. The laggings are left in for three weeks; timber false work is then removed and the hooks cut off.

The track consists of 60 ft. G.W.R. 00

steelwork is well brushed, and given a coat of carbon tar.

A special crane for relaying in tunnels, authorised by the former Great Western Railway, is now being built by the Chief Mechanical Engineer, and it is anticipated that it will be used for relaying and reballasting work during the winter of 1948-49.

Normal day-to-day maintenance is

WESTERN REGION CEMENT CONTAINERS.—Since May 31, specially designed waterproof road-rail containers, built by the Western Region, have been in use regularly for the first time to convey cement in bulk from Rhose to Rhayader for the construction of the Birmingham waterworks extension dam. Seventy-two of these containers are ready, and will afford a quicker, cleaner, and easier method of transport for large bulk consignments, resulting in a considerable saving in labour. The prototype, designed and built by the Chief Mechanical Engineer's Department, G.W.R., was described in our July 18, 1947, issue. Each container holds 3½ tons of cement, equal to 70 bags, and they are loaded three on a wagon. A hinged lid is fitted to the top, which can be clamped

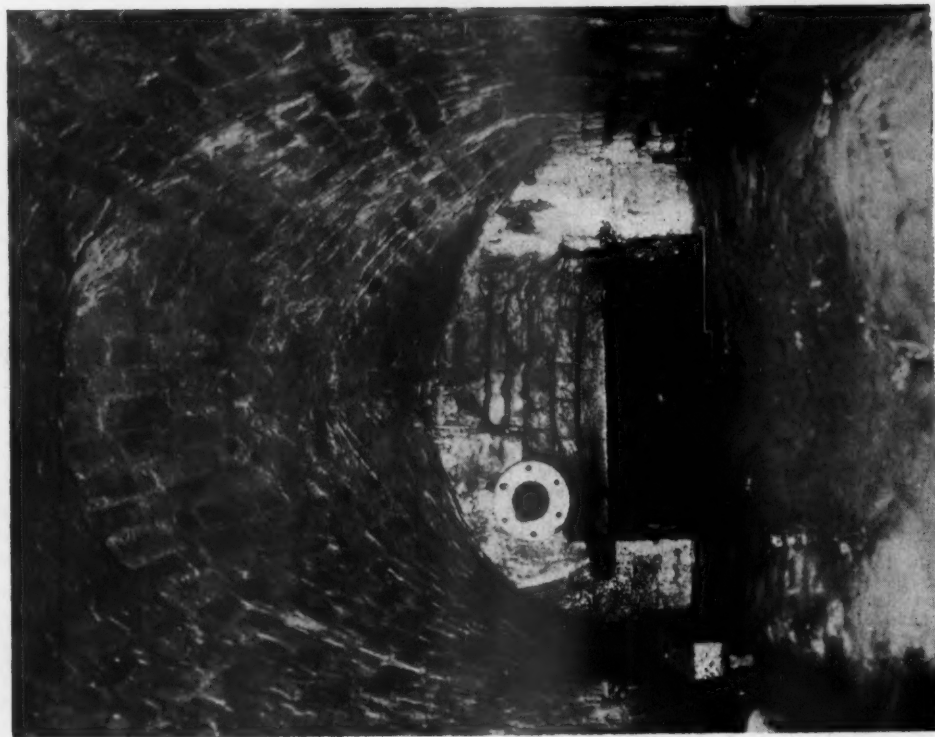
down after the cement has been poured in. At destination the container is unloaded from the lorry by crane and its contents deposited on the site by opening two hinged doors which form its base. Some 80,000 tons of cement are to be conveyed to Rhayader, and it is expected that 1,600,000 cement bags will be saved. For the present, the traffic will pass at the rate of about 50 tons every two days.

LOCOMOTIVE WORKS PRACTICE STANDARDISED.—It has been announced by the Locomotive Manufacturers' Association of Great Britain that, to enable detail design and manufacture of all types of locomotives and spare parts to be carried out at individual factories in an identical manner, providing standardisation and greater inter-

changeability in service, the whole locomotive industry of Great Britain has adopted a comprehensive standard works practice for limits and fits, full details of which will be included in a book to be issued.

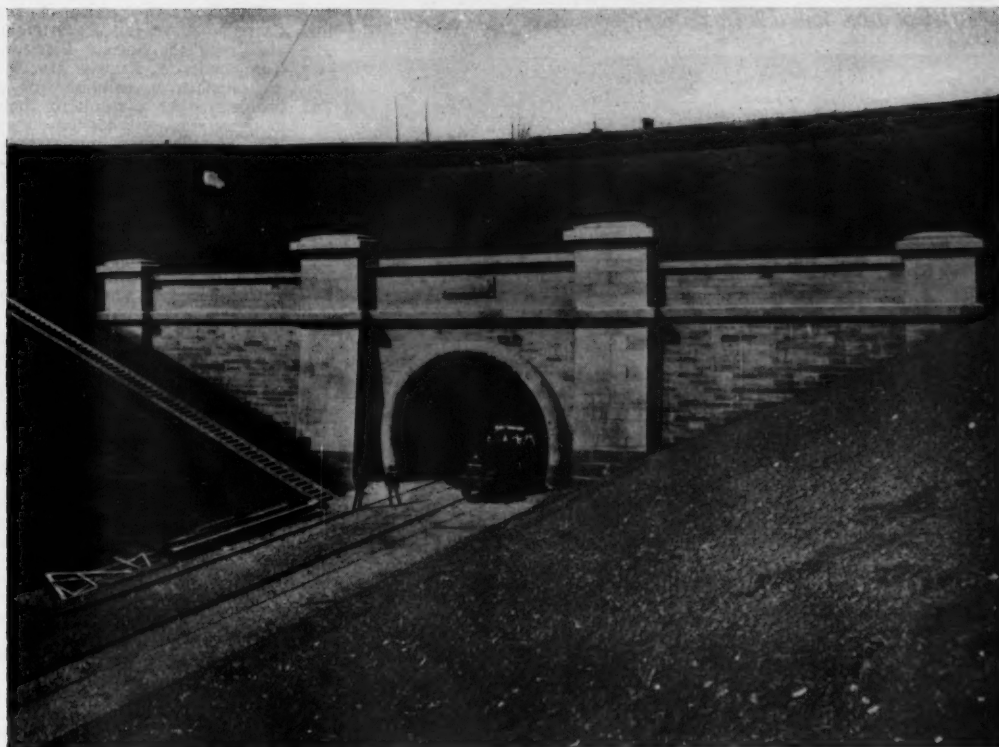
RAILWAY PLANNING IN BRAZIL.—The completion of new railway connections is included in a large-scale planning programme drawn up by the Brazilian Government. Some 2,000 km. of line are projected for connecting systems in the north and south, and a further 1,050 km. between railways in the centre of the country and the south. Other plans include laying 900 km. of branch lines, relaying 4,500 km. of track, and ballasting 5,700 km. New railway equipment comprises 220 locomotives, 300 coaches, and 5,000 wagons.

Weekend Works in the Severn Tunnel



Two views in the side heading to the Great Spring, showing (left) the junction of the culvert with the heading, and (right) the inlet side of the head wall, and the door leading to the main tunnel

Weekend Works in the Severn Tunnel



The Gloucestershire portal of the Severn Tunnel, photographed shortly before the railway was opened, in September, 1886



The Monmouthshire entrance to the Severn Tunnel. The original route to South Wales, via Gloucester, passes under the bridge on the right

Fluorescent Lighting in French Coaches

Equipment in French National Railways vehicles operates at once when switched on, and takes a.c. from an adapted voltage booster



Installation of fluorescent tubes in restaurant car

THE French National Railways have been experimenting with the use of fluorescent tubes for lighting passenger coaches. These have the advantages, first, of greater illumination for equivalent current consumption; and secondly, of eliminating dazzle resulting from direct vision of the lighting element. Two main problems had to be solved, one concerning the supply of alternating current, and the other the provision of a satisfactory method for immediate illumination when switching on.

In the first case, the maintenance of

lighting while the train is stationary demands a supply of direct current, obtained from accumulators, which are charged while the train is in motion by an axle-driven dynamo. With fluorescent tubes, however, it is more convenient to use alternating current, and it was necessary to find a method of conversion with the maximum electrical efficiency.

The second problem arose from the fact that with existing equipment, the response of fluorescent tubes is not instantaneous. A means was sought therefore of obviating this peculiarity, which has its drawbacks

for railway working, so that the tubes lit up immediately the current was switched on.

The Research Service of the S.N.C.F. Carriage & Wagon Department collaborated with the Société Electrom and the Compagnie des Lampes Mazda in finding a satisfactory solution of these two problems. As a result of their findings, modifications were carried out in the electrical installation of a passenger coach in service on the Western Region of the French National Railways. This type of coach was selected in order to take advantage of its constant voltage equipment, which had been installed to ensure a constant speed, irrespective of the state of charge of the accumulators, of the motor driving the fan associated with the air-conditioning equipment. This had been done by including a rotary voltage booster in the 64-volt d.c. equipment installed since 1936 in 200 passenger coaches of the Western Region. Similar equipment will be installed also in 350 express passenger vehicles now under construction.

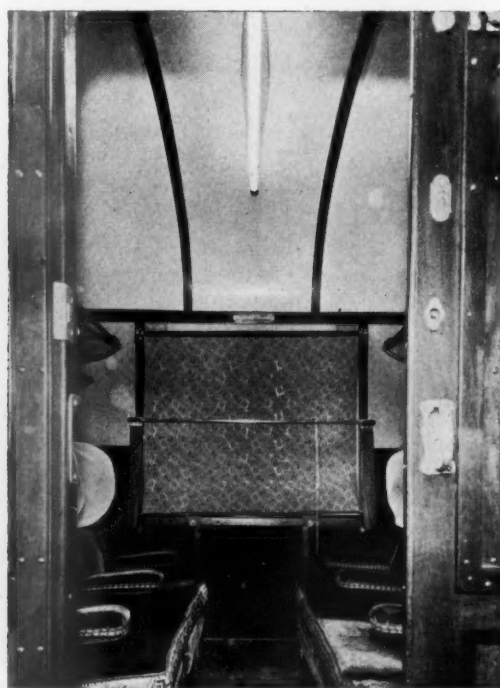
The principle of this constant voltage equipment is as follows. While the train is in motion, a 6.5-kW. generator supplies current at a constant pressure of 64 volts to the electrical circuits—lighting, ventilating, and auxiliary. The output of the booster, which varies between 0 and 18 volts, is added to that supplied by the dynamo, and is adjusted automatically, according to the state of charge of the accumulators, to supply them with an increased voltage up to the maximum when fully charged, i.e., 82 volts.

While the train is stationary, the accumulators supply current to the electrical circuits with the help of the voltage booster, which increases the voltage progressively according to the rate of discharge from the accumulators so as to maintain a supply of current at a constant voltage of 64 to the terminals of the different items of electrical equipment.

Previously, the installation of fluorescent



Corridor lighting with transverse tubes



Fluorescent tube in compartment ceiling

lighting in railway coaches entailed the use of an additional converter unit supplying alternating current to the tubes. The originality of the system now adopted lies in the use of the booster to provide both a d.c. supply varying from 0 to 18 volts, and three-phase 80-cycle a.c. at a constant pressure of 37 volts, whether the train is stationary or in motion. This a.c. voltage is applied to the primary of a transformer, from the secondary of which is taken a 110-volt supply feeding all the tubes in the vehicle.

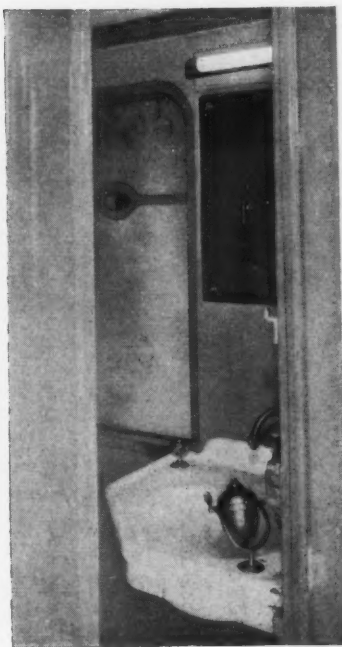
With this system, the conversion of the d.c. is effected at low cost by using an existing unit merely by addition of three slip-rings to pick up the a.c., giving a satisfactory output of approximately 83 per cent. efficiency, with a power factor of 0.89.

The lighting of the compartments comes from a straight tube, 39 in. long, fitted on a plate which is fixed to the ceiling by means of a special sheet-metal mounting housing the accessory equipment. This mounting includes at one end a neon lamp working off the 110-volt a.c. supply for use when passengers do not require the full lighting; and at the other end an ordinary 20-watt incandescent emergency lamp working off the 64-volt d.c. supplied either by the main dynamo while the train is in motion, or by the accumulators when stationary.

The emergency lamps in all the compartments are controlled simultaneously by placing the main lighting switch in the half-way position. This emergency lighting will be replaced by neon lights in the coaches now being equipped.

The corridor lighting is effected by four fluorescent tubes, 14 in. long, working at 110 volts a.c., and fitted transversely on the ceiling. Each tube has a special sheet-metal mounting which both provides protection and ensures a satisfactory diffusion of the light.

The end platforms of the coach and the lavatories are lit by a 14-in. tube fitted



Tube above mirror in toilet compartment

transversely over platforms, and longitudinally above the mirror in the lavatories. All the fluorescent tubes used are standard and conform to international specifications.

The new system of current supply to the tubes gives immediate starting and obviates flicker. Instant illumination is obtained by a completely new device evolved by the Campagnie des Lampes Mazda for the

French National Railways, which does not depend on cathode control or a tuning system, and is essentially static. As the current used is at 80 cycles, the stroboscopic effect, which at 50 cycles is already negligible, is practically eliminated.

Light readings were taken at a height of 39 in. from the floor and 16 in. from the back of the seats in two identical compartments of the same type of coach, both equipped for the supply of current at a constant 64 volts, but one lit by two 20-watt 64-volt incandescent lamps, and the other by one fluorescent tube consuming 33 watts. These readings showed that the illumination given by the tubes was 3.8 times greater than that provided by the incandescent lamps. The consumption of current was practically the same, allowing for the losses resulting from the conversion of current.

Test Run

The coach which has been equipped with the new system of lighting, and is now in regular service between Paris and Quimper, was tested previously during a run from Paris to Brest and back. It was placed immediately behind the locomotive, a position imposing the most severe test on the equipment, but it was found that both the tubes and the generating unit gave excellent results. The illumination was very pleasing, and absolutely stable whether the train was stationary or in motion, and whatever the speed of the train or the state of charge of the accumulators.

The voltage booster behaved perfectly, and the additional function imposed on it, of supplying alternating current, did not prove detrimental to the performance of its other duties, particularly that of charging the accumulators, which was very satisfactory throughout the whole test. The temperature of the generating unit taken on arrival in Paris after 11 hr. of continuous working at full charge was 27° C., which was well within safety limits.

British Railways Exhibit at the B.I.F.



Exhibits arranged by British Railways at the Birmingham Section of the British Industries Fair this year included scale models (2½ in. gauge) of various types of goods wagons and a Hallade track recorder instrument. The scale models were very popular with the general public and the Hallade instrument was explained to about 3,000 enquirers

Railway Benevolent Institution Home at Dorking

(See editorial note in last week's issue)



Exterior view of "Boxhurst"



A corner of the lounge



One of the bedrooms



The hall at "Boxhurst"

RAILWAY NEWS SECTION

PERSONAL

Mr. W. H. C. Kelland, Chief Engineer, Bengal Nagpur Railway, has proceeded on leave preparatory to retirement, and is succeeded by Mr. S. K. Panikkar.

Mr. C. S. Lock, Press Officer, Western Region, British Railways, who, as recorded in our April 30 issue, has been appointed Press Officer to the Railway Executive, joined the Great Western Railway in 1921. From 1927 until 1939, when he joined the Army, he was in charge of the G.W.R. Press Section. During the war he was a Deputy Assistant Director of Public Relations with Home Forces and with the

Mr. Harold Elliott, General Manager of Hay's Wharf Cartage Co. Ltd., Pickfords Limited and Carter Paterson & Co. Ltd., who, as recorded in our June 18 issue, has been appointed Chief Officer (Freight) to the Road Transport Executive of the British Transport Commission, was educated at Brighton College and then went to Switzerland in 1924 as an apprentice to the Société Anonyme A. Saurer (the Swiss commercial vehicle manufacturers). He joined Pickfords Limited (afterwards a subsidiary of Hay's Wharf Cartage Co. Ltd.) in 1926. After the acquisition of the group by the main-line railways in 1933, a comprehensive scheme was evolved for re-organising parcels carrying, based on a

The French Government has awarded Professor E. R. Hondelink the Order of the Legion of Honour, in recognition of his services as Director-General of E.C.I.T.O.

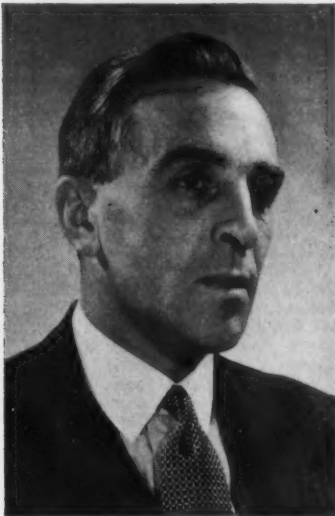
Mr. G. A. MacNamara, Vice-President of Traffic, Canadian Pacific Railway, recently arrived in England, on a visit.

Mr. C. M. Marsh, B.Sc.(Eng.), A.C.G.I., M.I.C.E., who, as recorded in our May 28 issue, has been appointed Divisional Waterways Officer, North-Western Division, Docks & Inland Waterways Executive, was born in 1899 at Kingston-on-Thames, and was educated at Charterhouse (senior



Mr. C. S. Lock

Appointed Press Officer to the Railway Executive



Mr. Harold Elliott

Appointed Chief Officer (Freight) to the Road Transport Executive



Mr. C. M. Marsh

Appointed North Western Divisional Waterways Officer, Docks & Inland Waterways Executive

C.M.F. On demobilisation in 1945 he was appointed Press Officer to the Great Western Railway. At the beginning of this year Mr. Lock was lent to the Railway Executive to assist in the setting up of the Press Office.

We regret to record the death on June 20, at the age of 63, of Mr. George Gordon Taylor Toller, O.B.E., who was Chief Engineer, Burma Railways, from 1937 to 1940.

SOUTHERN REGION STAFF CHANGES

The following staff changes have been announced in the Southern Region, British Railways:—

Accountant's Department

Mr. R. W. Kemp to be Assistant Accountant.

Mr. W. H. Appleton to be Assistant to Accountant, vice Mr. A. E. Holmes, retired.

Commercial Department

Mr. W. O. Spurgeon to be Assistant for Road Transport, vice Mr. A. H. Ramp-ton, retired.

Electrical Engineer's Department

Mr. F. T. Muncey to be Rolling Stock Engineer, vice Mr. A. E. Roberts, retired.

Mr. D. E. Bailey to be Power Supply Engineer.

Solicitor's Department

Mr. L. E. Williams to be Assistant Solicitor (Common Law).

new parcels depot at Willow Walk, Bermondsey; Mr. Elliott was appointed to take charge of that section. In 1938 he was appointed Commercial Assistant to the General Manager, and, as a member of the liaison committee, took part in the "square deal" negotiations with the railway companies; arising therefrom, he became an original member of the Road & Rail Central Conference. In June, 1940, he became Controller of Road Transport for the Ministry of Supply, and from December, 1942, to the end of 1944 was Director of Transport, Middle East Supply Centre, Cairo. On his return to civil life he was appointed Assistant General Manager of Hay's Wharf Cartage Co. Ltd. in June, 1945; and he became General Manager of the Hay's Wharf Cartage group in October, 1947. Mr. Elliott is a central member of the Road Haulage Central Wages Board; a Member of Council of the Institute of Transport; and a Vice-Chairman of the Meat Transport Organisation Limited.

Mr. N. Readman has been appointed Deputy Managing Director of the Consolidated Pneumatic Tool Co. Ltd.

The council of the Royal Society of Arts has appointed Mr. Christian Barman to be a Royal Designer for Industry in recognition of his work for modern transport design. Mr. Barman is Publicity Officer, British Transport Commission.

scholar) and at the City & Guilds Engineering College. He saw service in France and Belgium as 2nd Lieutenant, Royal Garrison Artillery, from 1917 to 1919. After training in harbour engineering with Mr. N. G. Gedy, M.I.C.E., he served as Irrigation Engineer on Colombo flood schemes, 1925-29, and Resident Engineer, River Wear Commission, Sunderland, 1929-30. Mr. Marsh joined the Weaver Navigation as Assistant Engineer & Manager in 1931, and has been Engineer & Manager, Weaver Navigation, from 1934 to 1947. He has been a member of the Canal Association's executive committee from 1935; Canal Joint Council in 1938 and from 1941; Upper Mersey Navigation Commission from 1934 (Vice-Chairman since 1944); North-Western Regional Canal Committee, 1940-47 (Vice-Chairman from 1941); North-Western Regional Joint Council for Inland Waterways from 1941 (Vice-Chairman, 1941-42; Chairman, 1942-43); and National Joint Council for Inland Waterways from 1941. He was also a member of the Engineering Committee, Ministry of Transport, 1941-47, of which he was Chairman from 1945-47.

We regret to record the death on June 18, at the age of 65, of Mr. Walter Dingle Knight, A.M.I.C.E., who retired in 1934 from the position of Chief Mechanical Engineer, Egyptian State Railways.

Mr. H. J. Guthrie, Signal & Telegraph Superintendent, Irish Transport Company (Coras Iompair Éireann), has been appointed Signal & Electrical Engineer, subsequent to the retirement of Mr. Warren Storey, Electrical Engineer.

We regret to record the death of Mr. L. Eric Darch, who until 1943 was Personal Assistant to the Chief Engineer, Central Argentine Railway.

Mr. J. J. Goodwin has been appointed Passenger Agent, Southampton, Canadian Pacific Railway.

Mr. J. A. V. Watson, Publicity Manager of C. C. Wakefield & Co. Ltd. since 1930, has been appointed General Manager, Castrol Sales. He is succeeded as Publicity Manager by Mr. A. A. Barr, who has been his assistant for some years.

Mr. C. H. Hill, Chief Mechanical Engineer, Sudan Railways, is retiring, and will be succeeded by Mr. G. K. Wood.

Mr. L. W. N. Robins has been appointed Secretary & Accountant of Beckett, Laycock & Watkinson Limited. Mr. Robins has been connected with the engineering industry for many years, and relinquished a position with the Rootes Group to take over his new appointment.

Mr. Mushtaq Ahmad (Joint Financial Secretary, Communications, Pakistan) and Mr. N. A. Qureishy (Deputy Chief Operating Superintendent, North Western Railway), members of the Pakistan Railway Stores Purchasing Mission, are now in England. Mr. Z. H. Khan (Secretary, Ministry of Communications), who will lead the mission, is about to arrive in London. Mr. Mushtaq Ahmad is also acting as observer to the meeting of the Commonwealth Communications Councils. The mission contemplates, on completion of its work in this country, a tour of European countries and the U.S.A.



The late Mr. R. S. Griffiths

Formerly Sales Engineer (Signals), Westinghouse Brake & Signal Co. Ltd.

We regret to record the death on June 15, at the age of 73, of Mr. Ralph S. Griffiths, A.M.I.Mech.E., M.I.R.S.E., M.Inst.T., who in 1946 retired from the service of the Westinghouse Brake & Signal Co. Ltd., after 54 years with that company and its incorporated firm of McKenzie & Holland Limited. His father, Mr. William Griffiths, joined McKenzie, Clunes & Holland at its inception in 1862, and remained with it, after its formation into a limited-liability company, as a Director until his retirement. Mr. Ralph S. Griffiths joined McKenzie & Holland Limited in 1892. After several years as its Southern Area Representative, he was appointed its Assistant Manager in 1914.

On the absorption of that company by the Westinghouse Brake & Signal Co. Ltd., he was appointed Sales Engineer (Signals). Early in 1942 he inaugurated the company's library, and he acted as librarian until his retirement. During his career he had been actively concerned with many large installations. Mr. Griffiths was a Past-President of the Institution of Railway Signal Engineers, for his paper before which, "The Double Wire System of Mechanical Signalling," he was awarded the first prize for the session 1925. He was also a Fellow of the Permanent Way Institution. For many years he was a lecturer at the City & Guilds College on Railway Signalling.

We regret to record the death on June 16 of Mr. J. M. Colle, Director of Working, Belgian National Railways.

EASTERN REGION STAFF CHANGES

The following staff changes are announced in the Eastern Region, British Railways:—

Mr. J. Royston, District Superintendent, Manchester, to be Assistant Operating Superintendent (Western Section), Eastern Region.

Mr. M. G. Maycock, Assistant Civil Engineer, Scottish Region, Edinburgh, to be District Engineer, Eastern Region.

Mr. R. A. Taylor, Goods Agent, Cambridge, to be Stationmaster, Cambridge, succeeding Mr. S. N. Wright, retired.

Mr. J. R. Shewan, Electrical Engineer, Scottish Region, Edinburgh, has been appointed Electrical Engineer (London), Eastern Region.

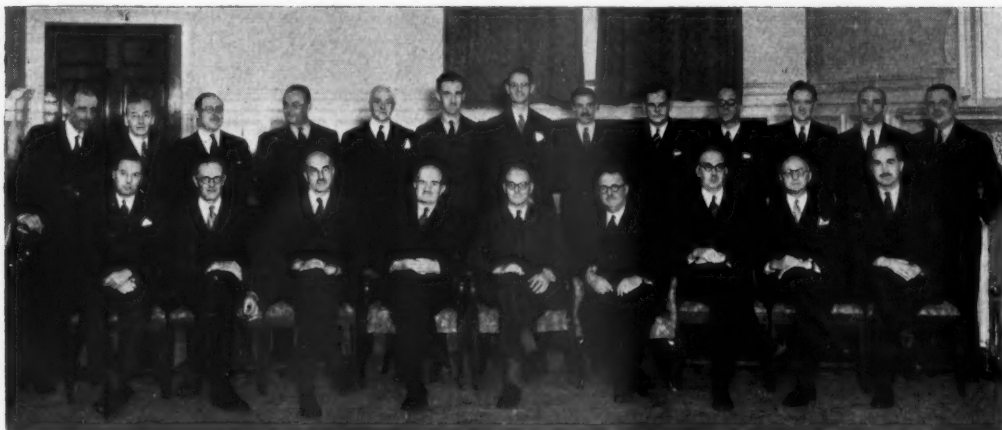
COLONIAL RAILWAY APPOINTMENTS

The Secretary of State for the Colonies recently approved the following appointments:—

Mr. P. A. Hanton to be Assistant Engineer, Tanganyika Government Railways.

Mr. W. B. Canning to be Assistant Engineer, Kenya & Uganda Railways and Harbours.

Visit of General Sir William Slim to the North Eastern Region



A group including General Sir William Slim, Deputy-Chairman of the Railway Executive, taken during his recent visit to the North Eastern Region, with Mr. C. P. Hopkins, Chief Regional Officer, and other officers of the region

Back row (left to right).—Messrs. H. S. Cole (Chief of Police), W. Mackenzie (Chief Engineer for Docks), R. A. Smeddle (Mechanical Engineer), G. Tunbridge (Estate Surveyor), J. L. Meadowcroft (Hotels Superintendent), M. B. Thomas (Advertising Manager), J. H. Fraser (Signal & Telecommunications Engineer), Major J. Croucher (Railway Executive), Messrs. F. H. Petty (Assistant Locomotive Running Superintendent), C. Cooper (Regional Staff Officer), A. E. Boothroyd (Regional Solicitor), B. X. Jessop (Assistant Goods Manager), George Dow (Press Relations Officer)

Front row (left to right).—Messrs. J. E. M. Roberts (Passenger Manager), F. H. Colebrook (Stores Superintendent), E. M. Rutter (Superintendent), General Sir William Slim, Messrs. C. P. Hopkins, A. H. Peppercorn (Chief Mechanical Engineer), J. Taylor Thompson (Civil Engineer), F. H. Sedgwick (Accountant), S. A. Finnis (Assistant Chief Regional Officer)

British Electric Traction Co. Ltd.

The 52nd annual general meeting of the British Electric Traction Co. Ltd. was held in London on June 18.

Mr. H. C. Drayton, the chairman, in the course of his speech, said: The gross revenue for the year to March 31, 1948, exceeded the million pounds mark, the actual figure being £1,206,000. After deducting expenses, taxation, which naturally shows a large increase, and debenture interest, we are left with a net profit of £574,000, the highest in our history.

The book value of our quoted investments at March 31, 1948, was £4,853,000, and their middle market price at the same date was £19,586,000. I think I may add that the value of our unquoted securities, which stand in the books at £2,859,000, is more than this figure.

On April 1 last our electricity supply undertakings were taken over by the appropriate authorities under the Electricity Act of 1947. These interests were held through the B.E.T. Electricity Supply and National Electric Construction Companies, of which your company holds the capital. The take-over prices had to be arranged, as the stocks did not have a Stock Exchange quotation. The basis was to take a percentage of the earnings and to capitalise this percentage on a varying yield basis. This was not a particularly satisfactory method of arriving at a valuation of an undertaking. The amount of electricity stock received was £1,408,000.

The other asset we had in the B.E.T. Electricity Supply Company was a controlling interest in Antrim Electricity Supply. This undertaking has been acquired by the Electricity Board for Northern Ireland under a vesting order, and the B.E.T. Electricity Supply share of the consideration is approximately £790,000. In the case of the Antrim take-over, the Northern Ireland Board paid cash; thus we received the full value, as contrasted with the compensation under the 1947 Electricity Act, in respect of which we received a piece of paper with a face value in excess of the price in the market.

It is a curious thing that coal, under nationalisation, is costing more, and less is produced, than was the case under private enterprise before the war, and the first thing that happens to the electricity supply industry under nationalisation is a breakdown in supplies, in what is certainly not the coldest weather, and an increase in prices. Excuses are given for these happenings such as shortage of capital equipment, but the plain fact is that under private enterprise and the capitalist system these things did not happen, but they have happened under nationalisation.

The effect of the Transport Act in its application to passenger road transport undertakings, in which your company is so largely interested, is dealt with in the directors' report. In the event of the undertakings of our associated companies being acquired by the British Transport Commission under the provisions of the Act, compensation would be based on asset values plus from two to seven years' purchase of the average profits for the last three financial years ending within the year 1948. We have always taken and still take the view that the operation of provincial omnibus services is not a job for Whitehall planners. Under the present system of company and municipally-owned undertakings, the public are provided with efficient services at low fares, and local consideration is given to local traffic needs. It would be a sorry day for the travelling

public if the bus services of this country were nationalised.

The provincial omnibus industry is one of the few industries that has not put up its prices to the public for a great number of years, although it has had to meet substantially increased costs. Our companies' wage bills have increased since April 1, 1947, by approximately £3,000,000 per annum; of this over £1,000,000 has arisen since the so-called "standstill" was sought under the Government's wages and prices plan. Fuel has increased since before the war by approximately 54 per cent., and the price of a double-deck omnibus has risen from about £1,700 in 1939 to no less than £4,000 today.

The report was adopted.

Mechanical Stoker Fitted to Southern Region Locomotive

For some time it has been the opinion of Mr. O. V. Bulleid, Chief Mechanical Engineer, Southern Region, that adequate steam raising in a locomotive boiler under all conditions, can be ensured only by fitting a mechanical stoker. As a result, the "Merchant Navy" class 4-6-2 locomotive, *Canadian Pacific*, has been fitted with an American-type Berkley locomotive stoker, which can deliver coal up to a maximum rate of 5 tons per hr.

The apparatus was obtained from the Berkley Stoker Co. Ltd., London, and manufactured to the requirements of the Southern Region, by the associated company in the U.S.A.

The stoker consists of a coal crusher and conveying screws, which deliver coal from the tender to a distributor plate fitted in the firehole door. The screws are driven by a steam engine which, in this case, is fitted on the tender. The quantity of coal delivered to the distributor plate is controlled by the speed of the stoker engine, which is connected to the conveying screws. The coal is discharged from the distributor plate by a range of steam jets, disposed so that the coal can be spread over the full area of the grate. The amount of coal delivered at any particular part of the grate, is governed by the manipulation of the jet valves, which control the quantity of steam to each nozzle; the steam pressure to these nozzles is indicated on steam pressure gauges.

A particular advantage of the stoker is that it adequately can deal with varying types of fuel; it crushes the coal, without producing an undesirable amount of dust, to a size easily dispersed by the steam jets over the whole length and width of the grate. It is capable of handling slack coal in wet or dry condition, as well as the hardest run of mine coal.

The firedoor is not in any way obstructed by the Berkley stoker and can be used for hand firing, should this be necessary. The doors are equipped with peep-holes, which permit observation of the fire without their being opened. The stoker is almost silent and causes no inconvenience to the engine crew; furthermore, a very thin fire can be maintained in the grate and so a high degree of fuel combustion is ensured.

Trials have been carried out with the stoker and so far have proved very satisfactory, in that the steaming of the boiler has been maintained at a rate sufficient to cover any of the duties the locomotive has been called on to perform, despite the fact that poor quality coal has been used.

Questions in Parliament

Children's Railway Fares

Lt.-Colonel Geoffrey Clifton-Brown (Bury St. Edmunds—C.) on June 14 asked the Minister of Transport if he would now make a statement on the decision reached by the British Transport Commission on the question of raising the age at which children could enjoy the benefit of half fares to the school-leaving age of fifteen years.

Mr. Alfred Barnes stated in a written answer: No, Sir. As I indicated in replies given on February 2, this matter is one for the British Transport Commission. I am, however, bringing Colonel Clifton-Brown's question to the attention of the Commission.

Central Transport Consultative Committee

Mr. Ernest Davies (Enfield—Lab.) on June 14 asked the Minister of Transport if he would state the national bodies which had been invited to make nominations for the Central Transport Consultative Committee.

Mr. Alfred Barnes: In view of the number of bodies invited I propose to circulate a list of them.

Mr. Davies then asked if, when reasonable time had elapsed, the Minister had not received nominations from those bodies, he would urge speed in the matter, because of the need to set up the consultative committee.

Mr. Barnes: Yes, certainly.

Later, Mr. Barnes circulated the following list:—

National Farmers' Union; National Farmers' Union for Scotland; Federation of British Industries; National Union of Manufacturers; Association of British Chambers of Commerce; National Coal Board; General Council of British Shipping; Trades Union Congress (two members); Parliamentary Committee of the Co-operative Congress; County Councils' Association (two members); Association of Municipal Corporations (two members); and the Association of County Councils in Scotland, Convention of Royal Burghs and Scottish Counties & Cities Association (one member jointly).

Government Use of Paper

Brigadier R. Rayner (Totnes—C.) on June 3 asked the Chancellor of the Exchequer if he would provide figures showing the average amount of paper and stationery consumed by each of the principal Government departments during the period 1929-39; and how that compared with such consumption during the year 1947 or the last year for which figures were available.

Mr. Glenvil Hall (Financial Secretary to the Treasury), in a written answer, stated: The following is the available information:—

Department	Annual average, 1931 to 1938	1947
	tons	tons
Admiralty	2,150	3,620
Ministry of Agriculture	240	930
Air Ministry	1,590	3,480
Customs & Excise	680	380
Ministry of Food	—	3,860
Foreign Office (including Diplomatic and consular services)	340	2,020
Foreign Office (German Section)	—	1,040
Ministry of Fuel	50	760
Inland Revenue	2,650	5,210
Ministry of Health	660	360
Ministry of Labour	1,530	1,410
Ministry of National Insurance	—	2,030
Parliament (House of Commons)	140	680
Post Office (excluding Directorates)	4,780	5,120
Post Office (Telephone Directorates)	6,710	6,090
Ministry of Supply	—	2,330
Board of Trade	350	1,610
War Office	2,440	9,070
Ministry of Works	330	1,180
Totals	24,640	51,180

British Transport Commission Statistics

Summary of the principal statistics for
the four-week period ended March 21

The third of the four-weekly transport statistics bulletins, published by the British Transport Commission, covers the period to March 21.* As explained in the article on page 698 of our June 11 issue, there would be little point in discussing the operating results, because the coal crisis in 1947 upsets comparisons with the corresponding period of last year. The accompanying statements show large increases for 1948 over 1947 in freight traffic receipts, tonnage originating, net ton miles, freight train miles and wagon miles. These increases are in a large measure illusory, though the volume of freight traffic during the first 12 weeks of this year was well above the 1946 level. The improvement was confined to minerals and coal, however. Merchandise declined to such a degree that fewer wagons were needed to carry all classes of traffic than in 1946.

These facts explain why wagon supply has been equal to demand in recent months, in spite of 21,853 fewer wagons being available on March 21 last, than twelve months previously. About 11 per cent. of the total stock was at that date "under or awaiting repair." Locomotive repairs have been taken in hand effectively; in March, 536 more engines were available, though 53 were scrapped during the period and only 33 new engines put into service. The total stock of passenger coaches was reduced by 63, but the serviceable stock was increased by 1,259 vehicles. The train load in March was 157 tons,

the highest figure reached this year and 7 tons above 1947. On the other hand, the average wagon load was low at 6.38 tons. A freight train speed of 7.83 m.p.h. cannot be regarded as satisfactory; the London Midland Region, as is usual,

had the poorest result, with an average of 6.61 miles an hour.

An editorial on page 733 comments on the increase in the number of staff employed by British Railways since January 1. London Transport staff is growing also, numbering 98,178 on March 21. Much the largest grade consists of road drivers and conductors. In the March period, the number of passenger journeys by road vehicles was 298,200,000—nearly six times those by London Transport railways.

1. BRITISH TRANSPORT COMMISSION TRAFFIC RECEIPTS

	Four weeks to March 21		Inc. or dec.	Aggregate to March 21		Inc. or dec.
	1948	1947*		1948	1947*	
British Railways (receipts from railway working—)	£000	£000	£000	£000	£000	£000
Passengers	7,601	6,533	+ 1,068	22,415	19,998	+ 2,417
Parcels, etc., by passenger train ...	2,161	1,947	+ 214	6,394	5,536	+ 858
Merchandise (other than Classes 1-6) ...	7,338	4,342	+ 2,996	21,277	14,434	+ 6,843
and livestock	2,288	1,062	+ 1,226	6,652	4,000	+ 2,652
Minerals & merchandise (Classes 1-6) ...	5,437	4,132	+ 1,305	16,012	12,035	+ 3,977
Coal & Coke						
Total	24,825	18,016	+ 6,809	72,750	56,003	+ 16,747
London Transport—						
Railways	1,113	1,008	+ 105	3,337	2,891	+ 446
Buses & coaches	2,339	2,051	+ 288	6,882	5,643	+ 1,239
Trolleybuses & trams	843	750	+ 93	2,506	2,087	+ 419
Total	4,295	3,809	+ 486	12,725	10,621	+ 2,104
Inland Waterways—						
Tolls	56	23	+ 33	163	102	+ 61
Freight charges, etc.†	82	54	+ 28	227	174	+ 53
Total	138	77	+ 61	390	276	+ 114
Total	29,258	21,902	+ 7,356	85,865	66,900	+ 18,965

* British Transport Commission Transport Statistics, 1948, Series No. 3, Period to March 21. London: British Transport Commission. Price 1s.

* The comparison of 1948 with 1947 is affected by increases in fares, rates and charges, introduced during the year 1947.

† Not including freights earned by vessels not owned by the Commission

2. BRITISH RAILWAYS

(A) Passenger Journeys Originating

	Region						Total
	London Midland	Western	Southern	Eastern	North Eastern	Scottish	
	+ or — over 1947 Per cent.	+ or — over 1947 Per cent.	+ or — over 1947 Per cent.	+ or — over 1947 Per cent.	+ or — over 1947 Per cent.	+ or — over 1947 Per cent.	+ or — over 1947 Per cent.
Full fares	1,691,807 (+5.59)	1,200,542 (—8.62)	2,194,787 (+13.93)	953,873 (+41.24)	205,999 (—17.46)	354,343 (—8.97)	6,601,351 (+7.22)
Monthly returns	8,249,888 (+19.63)	2,834,815 (+4.96)	9,168,076 (+26.71)	2,470,490 (+15.77)	896,052 (—4.31)	1,315,142 (—11.64)	24,934,463 (+16.56)
Excursion, week-end, cheap day, etc.	1,405,460 (+122.01)	728,322 (+84.97)	925,243 (+43.23)	327,992 (+82.63)	258,046 (+60.25)	336,968 (+134.01)	3,982,031 (+84.57)
Workmen	7,257,622 (—5.46)	1,906,034 (—8.38)	6,128,960 (+1.80)	1,868,488 (—10.60)	975,532 (—16.30)	1,024,679 (—3.40)	19,161,315 (—4.64)
Other descriptions	1,588,154 (—1.83)	986,539 (—13.51)	1,669,774 (—7.90)	769,018 (+4.84)	440,258 (—5.54)	427,625 (—18.50)	5,881,368 (—6.58)
Total, excluding season tickets	20,192,931 (+9.59)	7,656,252 (+0.35)	20,086,840 (+13.86)	6,389,861 (+9.93)	2,775,887 (—6.81)	3,458,757 (—4.11)	60,560,528 (+7.96)
Season tickets (all descrip- tions)	6,101,133 (—16.68)	2,642,396 (—11.48)	13,037,874 (+15.08)	2,323,150 (—16.23)	659,350 (—21.91)	1,917,543 (—16.69)	26,681,446 (—3.18)
Total, including season tickets	26,294,064 (+2.12)	10,298,648 (—2.97)	33,124,714 (+14.34)	8,713,011 (+1.48)	3,435,237 (—10.14)	5,376,300 (—9.01)	87,241,974 (+4.29)

(B) Freight Tonnage Originating

	Region						Total
	London Midland	Western	Southern	Eastern	North Eastern	Scottish	
	+ or — over 1947 Tons Per cent.	+ or — over 1947 Tons Per cent.	+ or — over 1947 Tons Per cent.	+ or — over 1947 Tons Per cent.	+ or — over 1947 Tons Per cent.	+ or — over 1947 Tons Per cent.	+ or — over 1947 Tons Per cent.
Merchandise (excluding Classes 1-6) & livestock ...	1,345,800 (+30.81)	817,603 (+16.34)	276,170 (+5.90)	643,900 (+24.59)	612,300 (+43.73)	673,386 (+30.78)	4,369,159 (+26.64)
Minerals & Merchandise (Classes 1-6)	1,610,100 (+68.53)	619,835 (+48.01)	146,727 (+41.43)	654,800 (+44.87)	798,000 (+62.33)	626,600 (+51.88)	4,456,062 (+57.23)
Coal & Coke	4,425,900 (+46.63)	1,938,531 (+18.74)	290,475 (+0.55)	1,962,500 (+9.88)	2,338,300 (+12.16)	1,678,306 (+12.30)	12,634,012 (+9.71)
Total, all classes of traffic ...	7,381,800 (+18.81)	3,375,969 (+22.58)	713,372 (+9.18)	3,261,200 (+18.38)	3,748,600 (+24.86)	2,978,292 (+22.97)	21,459,233 (+20.56)

(C) Net Ton Miles

	Region						Total
	London Midland	Western	Southern	Eastern	North Eastern	Scottish	
	+ or — over 1947 per cent.	+ or — over 1947 per cent.	+ or — over 1947 per cent.	+ or — over 1947 per cent.	+ or — over 1947 per cent.	+ or — over 1947 per cent.	+ or — over 1947 per cent.
Merchandise (excluding Classes 1-6) & livestock	189,436,392 (+40·31)	113,729,529 (+27·63)	23,810,310 (+2·33)	87,116,811 (+53·19)	54,481,065 (+71·17)	96,397,472 (+75·62)	564,971,579 (+44·51)
Minerals & merchandise (Classes 1-6) ...	134,464,386 (+87·25)	67,355,523 (+78·38)	14,926,665 (+39·69)	94,048,149 (+83·87)	35,556,765 (+135·39)	45,461,591 (+112·14)	391,813,079 (+88·42)
Coal & coke ...	288,096,854 (+4·99)	130,229,934 (+3·12)	25,764,091 (—2·68)	171,964,092 (+12·03)	67,344,715 (+9·58)	69,841,105 (+14·69)	753,240,791 (+7·15)
Total, all classes of traffic ...	611,997,632 (+27·18)	311,314,986 (+22·97)	64,501,066 (+6·74)	353,129,052 (+35·03)	157,382,545 (+45·20)	211,700,168 (+54·29)	1,710,025,449 (+31·35)

(D) Train Miles

	Region						Total
	London Midland	Western	Southern	Eastern	North Eastern	Scottish	
	+ or — over 1947 per cent.	+ or — over 1947 per cent.	+ or — over 1947 per cent.	+ or — over 1947 per cent.	+ or — over 1947 per cent.	+ or — over 1947 per cent.	+ or — over 1947 per cent.
Coaching train miles—							
Loaded ...	4,272,394 (+1·66)	2,628,601 (+0·52)	3,936,140 (+0·29)	2,339,327 (+6·75)	1,023,030 (+2·54)	1,710,908 (+0·87)	15,910,400 (+1·81)
Empty ...	135,824 (—0·32)	117,764 (+0·26)	96,447 (—3·61)	88,067 (+17·14)	45,586 (+12·17)	57,397 (+0·97)	541,085 (+2·78)
Total loaded & empty ...	4,408,218 (+1·60)	2,746,365 (+0·50)	4,032,587 (+0·19)	2,427,394 (+7·10)	1,068,616 (+2·92)	1,768,305 (+0·87)	16,451,485 (+1·84)
Freight train miles—							
Loaded ...	3,052,649 (+27·46)	1,680,685 (+26·62)	550,619 (+5·76)	1,676,265 (+30·81)	919,600 (+41·46)	1,501,401 (+35·48)	9,381,219 (+28·81)
Empty ...	540,078 (+10·81)	204,946 (+16·21)	12,358 (—27·37)	334,166 (—1·87)	189,818 (+7·21)	207,391 (+6·93)	1,488,757 (+6·93)
Total loaded & empty ...	3,592,727 (+24·64)	1,885,631 (+25·40)	562,977 (+4·71)	2,010,431 (+23·95)	1,109,418 (+34·13)	1,708,792 (+31·23)	10,869,976 (+25·30)
Total coaching & freight train miles—							
Loaded ...	7,325,043 (+11·03)	4,309,286 (+9·31)	4,486,759 (+0·93)	4,015,592 (+15·63)	1,942,630 (+17·90)	3,212,309 (+14·55)	25,291,619 (+10·39)
Empty ...	675,902 (+8·38)	322,710 (+9·83)	108,805 (—7·06)	422,233 (+1·56)	235,404 (+8·14)	264,788 (+5·58)	2,029,842 (+5·79)
Total loaded & empty ...	8,000,945 (+10·80)	4,631,996 (+9·34)	4,595,564 (+7·06)	4,437,825 (+14·13)	2,178,034 (+16·76)	3,477,097 (+13·81)	27,321,461 (+10·04)

(E) Wagon Miles

	Region						Total
	London Midland	Western	Southern	Eastern	North Eastern	Scottish	
	+ or — over 1947 per cent.	+ or — over 1947 per cent.	+ or — over 1947 per cent.	+ or — over 1947 per cent.	+ or — over 1947 per cent.	+ or — over 1947 per cent.	+ or — over 1947 per cent.
Loaded wagon miles—							
Merchandise (excluding Classes 1-6) & livestock	53,896,777 (+42·95)	29,800,212 (+32·66)	7,073,770 (+1·97)	23,743,697 (+54·57)	17,259,195 (+66·20)	25,024,265 (+64·81)	156,797,916 (+45·14)
Minerals & merchandise (Classes 1-6) ...	12,078,218 (+75·89)	7,107,562 (+79·48)	1,710,567 (+33·28)	9,187,440 (+76·46)	3,421,048 (+129·55)	5,000,615 (+104·58)	38,505,450 (+81·19)
Coal & coke ...	28,609,249 (—0·79)	11,806,028 (+2·87)	2,644,858 (—6·12)	17,009,004 (+5·22)	5,590,188 (—0·10)	6,890,639 (+8·35)	72,549,966 (+1·82)
Total loaded wagon miles	94,584,244 (+28·85)	48,713,802 (+28·53)	11,429,195 (+3·55)	49,940,141 (+35·96)	26,270,431 (+50·37)	36,915,519 (+53·89)	267,853,332 (+33·57)
Empty wagon miles ...	35,278,141 (+15·83)	15,244,247 (+25·77)	4,254,784 (+4·45)	23,878,842 (+13·98)	9,286,249 (+16·10)	10,674,162 (+22·77)	98,616,425 (+16·99)
Total wagon miles, loaded & empty ...	129,862,385 (+25·03)	63,958,049 (+27·86)	15,683,979 (+3·79)	73,818,983 (+27·97)	35,556,680 (+39·61)	47,589,681 (+45·62)	366,469,757 (+28·66)

(F) Rolling Stock Position

	Operat- ing stock	Number repair	Service- able stock	Service- able stock in 1947
Locomotives ...	20,378	4,180	16,198	15,662
Coaching vehicles ...	55,428	6,646	48,782	47,291
Freight wagons ...	1,207,863	136,313	1,071,550	1,093,403

3. INLAND WATERWAYS

Tonnage of traffic and ton-miles

	+ or — over 1947 per cent.	+ or — over 1947 per cent.
Tonnage		
General merchandise ...	273,270 (+86·16)	6,143,435 (+114·14)
Liquids in bulk ...	144,877 (+40·21)	3,235,696 (+48·29)
Coal, coke, patent fuel and peat ...	410,101 (+94·73)	6,466,794 (+189·26)
Total (all classes of traffic) ...	828,248 (+79·77)	15,845,925 (+117·47)

4. LONDON TRANSPORT

(A) Passenger Journeys Originating

	Number	+ or — over 1947 per cent.
Railways ...	50,179,034	+ 5·72
Buses and coaches ...	206,512,749	+10·31
Trams & trolleybuses ...	91,700,000	+11·70
Total ...	348,391,783	—

(B) Rail and Road Car Miles

	Miles	+ or — over 1947 per cent.
Railways ...	17,366,751	+11·17
Buses & coaches ...	23,586,220	+ 5·31
Trams & trolleybuses ...	8,655,993	+ 7·74
Total ...	49,608,964	+ 7·72

(C) Rolling Stock Position

	Operat- ing stock	Number under repair	Service- able stock	Service- able stock in 1947
Railway vehicles ...	3,946	447	3,431	3,314
Buses & coaches ...	7,344	1,097	6,247	6,021
Trams & trolleybuses ...	2,617	251	2,366	2,311

5. STAFF

	Total staff employed	British Rail- ways	London Trans- port	Inland Water- ways
Salaried (Administrative, Technical & Clerical) ...	120,432	109,166	10,519	648
Operating ...	396,369	338,242	56,576	1,551
Maintenance ...	241,904	212,650	27,460	1,794
Other ...	32,835	29,201	3,623	—
Total ...	791,540	689,259	98,178	3,993

Ministry of Transport Accident Report

Manchester Victoria, L.M.S.R.: December 10, 1947

Brigadier C. A. Langley inquired into the accident which occurred at about 3.52 a.m. on December 10, 1947, at Manchester Victoria Station, L.M.S.R., when the 6.50 p.m. special petrol train, Neville Hill to Eccles, got out of control on a falling gradient and, diverted to No. 7 bay platform, collided violently with the hydraulic buffers. It consisted of 20 loaded petrol tanks and 2 runner wagons, one next to the engine, the other next to the brake van, drawn by 0-8-0 Class "7" engine, No. 8903, total weight amounting to about 593 tons. The engine had vacuum brake on all wheels, including tender, giving a percentage of brake power of 66.2 with tender partly loaded. The van had a hand screw brake providing 90 per cent. brake power. The runner wagons had standard side brakes. Those on the petrol tank wagons were not used, as explained later.

The collision occurred at about 25 m.p.h. and the engine overrode the stops and came to rest in the concourse. The leading runner wagon was completely

with spirit must not be pinned down for braking purposes on inclines"; and on May 20, 1946, all chief controllers were instructed that "when trains consisting wholly of loaded petrol tanks are required to negotiate a gradient over which A.W.B. instructions apply, the train must be assisted by an engine coupled in front." Similar instructions were, however, not issued to running shed staff, nor were those in the timetables amended.

THE COURSE OF EVENTS

The train left Neville Hill in fine weather at 9.50 p.m. on December 9, travelling uneventfully until dense fog, with visibility 50 yd., was encountered at Miles Platting. On stopping at the notice board shown on the diagram, the guard pinned down the brake of the rear runner wagon, but the fireman did not do the same with the leading one, as the driver felt confident the engine would hold the load. The driver eased his brakes and allowed the train to roll forward slowly on the incline.

signal enabled Millgate to warn Turntable box that the train would be diverted to the station, where the route was set into No. 7 platform.

The guard applied his brake as soon as the train started, but noticed nothing unusual until the wheels began skidding. He released and re-applied several times, but speed increased and the van wheels kept picking up.

The driver who was returning from work noticed that the brake handle was right across at "on," the regulator closed, cylinder cocks open, and the reversing wheel in nearly full backward gear. Vacuum was 20 in. with train pipe "zero."

Examination showed the brake blocks, although worn, to be in good condition; also the tyres, which were without flats. Sanding gear was in working order.

The control staff had been advised that the train would consist of tank wagons, but nobody realised they were full of petrol. Tank traffic to Eccles from the east was normally empties or molasses. Heavy work dealing with coal traffic that night resulted in nobody checking the load card to ascertain whether the tanks were empty or loaded.

The Chief Controller stated that had he,

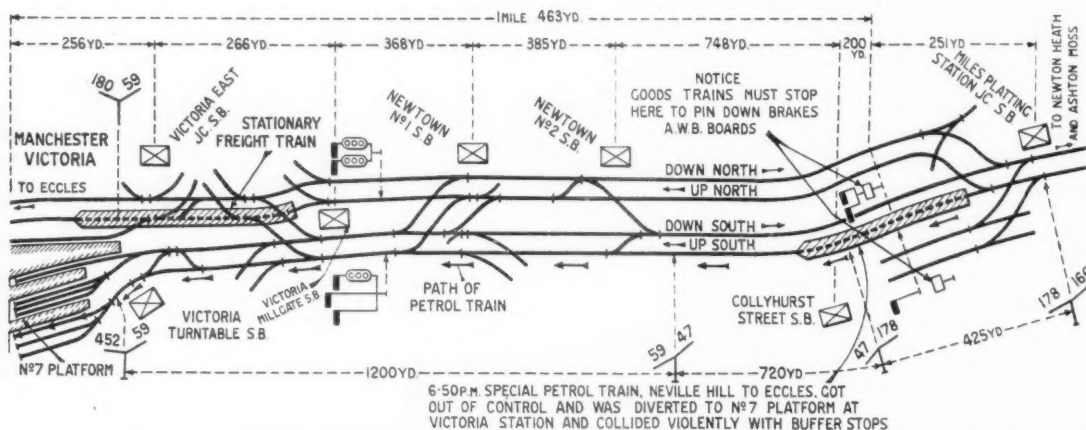


Diagram illustrating circumstances attending the accident at Manchester Victoria Station, December 10, 1947

destroyed. The first three tank wagons were derailed, strained, and leaking. Ten of the remaining vehicles, with the rear runner wagon and van, were undamaged. The others sustained minor damage, two being partly derailed.

The driver died of his injuries; the fireman also was injured, and the guard suffered from shock. An inspector summoned assistance promptly and took action to prevent an outbreak of fire. The situation was dealt with most efficiently by all concerned. A driver returning home assisted by putting out the fire of the engine.

It was damp and foggy, with visibility of about 40 to 50 yd., and a greasy rail. The accompanying diagram shows the lines, gradients, and other details essential to an understanding of what took place.

The relevant instructions for working trains down the Miles Platting incline and onwards are printed in the General Appendix to the working timetables, and in the case of a freight train the crew is instructed to apply sufficient wagon brakes to hold it without resort to the engine or van brakes. In the case of petrol trains, however, the pinning down of hand brakes is prohibited on account of possible danger from sparks, the relevant instruction reading: "hand brakes of tank wagons loaded

It appeared to be under perfect control, travelling very slowly—3 to 4 m.p.h.—until reaching Newtown No. 2 signal box, where the wheels began to skid.

Sand was applied without effect, and the fireman noted that the vacuum brake was fully applied. The engine was then reversed, the brake eased, and the regulator opened, but this only made the wheels spin backwards. The driver thereupon closed the regulator and applied the brakes and sand. In the darkness and fog the fireman could not tell whether they were effective, so he walked along the engine frame and verified that they were working properly.

The train continued to gather speed, with engine and tender wheels skidding. The fireman did not realise that the train had been diverted to the bay platform until he saw Turntable box through the fog. Nothing further could be done. As soon as the train got out of control the driver started sounding the whistle continuously, causing the signalman at Newtown No. 1 box to send the "train running away" signal to Millgate box, where the signalman had accepted the train to his home signal with his junction set for the terminal station, as the up south line ahead was blocked by a freight train.

The receipt of the "running away"

or any of his staff, realised that a loaded petrol train was to proceed down Miles Platting incline, an assistant engine would have been ordered in accordance with recognised practice.

INSPECTING OFFICER'S CONCLUSION

The available brake power was insufficient to hold the train under the prevailing conditions, with the rail damp and probably very greasy. All the evidence points to the driver having been quite confident that his engine was capable of controlling the load. He had worked it on other occasions and was particularly satisfied with its performance. It was fine when starting and he may have expected similar conditions at Manchester.

The load was equivalent only to 30 mineral wagons, as against an authorised 48, although with the latter load it would be necessary to stop to pin down brakes. The driver may have thought that the braking power of the engine provided sufficient margin of safety to enable him to negotiate the incline without difficulty, but he made a fatal error of judgment.

No blame attaches to the fireman, nor does any responsibility rest on the guard, who asked the driver whether he required an assistant engine. Prompt action was

taken in Newtown No. 1 box when the continuous whistling was heard, and the acceptance of the train by Millgate was in accordance with the regulations.

Had the Chief Controller ordered an assistant engine, the accident might not have occurred, but in the circumstances, with an accumulation of coal traffic to be handled urgently, it is perhaps excusable that particulars of the load card were not further checked, especially as the running of loaded petrol tanks to Eccles was quite unusual.

REMARKS

The instructions regarding working loaded petrol trains down inclines require clarification. Although the Divisional Operating Manager had issued instructions to chief controllers that an assistant engine must be provided for a loaded petrol train, similar instructions were not issued to the running shed staff. The driver was consequently placed in the difficult position of deciding on his own initiative whether his engine was capable of controlling the load. This feature has been recognised, and on February 7, 1948, the following amendment to the working timetables was issued:—

"General Instructions for Working Down Inclines (amended italic note to first paragraph): Hand brakes of tank wagons loaded with spirit must not be pinned down for braking purposes on inclines. Where in the case of trains conveying tank wagons containing spirit sufficient brake power would not be available on those sections of the line where these instructions apply

without using the hand brakes of the tank wagons, additional brake power must be afforded by the provision of an assistant engine attached to the front of the train."

Although instructions now require an assistant engine to be provided when necessary, it is still left to the driver to decide whether or not this assistance is required. Unlike the procedure applicable to normal freight trains, there is no practical means of deciding this, and consequently, the danger of a runaway due to an error of

judgment still exists. The risk can be reduced, however, either by providing an assistant engine in all cases, or by lifting the ban on pinning down brakes.

Brigadier Langley discussed this with the Chief Operating Manager, and was given to understand that the embargo was enforced only on the London Midland Region. He considers it to be for consideration whether there are any special conditions in this Region which justify its retention.



Scene at Manchester Victoria Station on December 10 after a train of petrol tank wagons had overrun the buffer stop

First Road Diesels Delivered to C.N.R.

Railway motive power in Canada entered a new phase with the delivery to the Canadian National Railways at Montreal on May 27 of the first of two powerful diesel-electric road locomotives. This locomotive, the first of its kind to be placed in regular service in Canada, was inspected on its arrival at Bonaventure Station by Mr. R. C. Vaughan, C.M.G.,

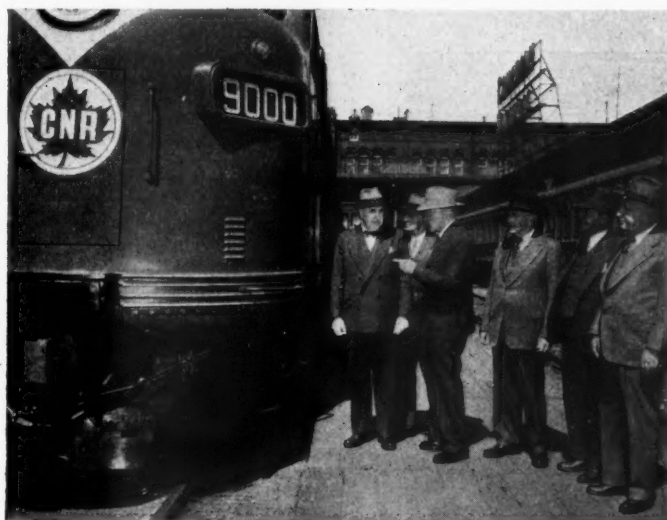
Chairman & President; Mr. N. B. Walton, C.B.E., Executive Vice-President; members of the board of directors, and other officers. Mr. Vaughan announced that the new diesels would be placed on the freight run between Toronto and Montreal to speed the service between these two large centres of Canadian industrial life. The new diesel, which is painted

attractively in green and gold, consists of three units of 1,500 h.p. each, built by the Electro-Motive Division of General Motors. A second triple-unit road diesel of the same type is going into service as well, completing the order placed by the railway last November (see our December 5, 1947, issue).

In announcing the purchase of the new diesels last November, Mr. Vaughan referred to the exhaustive tests made over C.N.R. lines in July, 1947, with a demonstration unit. An exacting schedule in heavy freight and fast passenger services was operated over 7,446 miles in 11 days. He recalled that the C.N.R. had pioneered in the use of diesel units in regular services on the North American continent in 1925, but he warned against under-rating the value of steam locomotives. The modern steam locomotive, he said, was the product of more than a century of motive power technology. Many factors must be weighed in evaluating the merits of the two forms of motive power.

The new streamline diesels will serve as heavy-duty freight locomotives with a top speed of 65 m.p.h. The 1,500-h.p. units may be operated singly or coupled in combinations of two or three, to provide 1,500, 3,000, or 4,500 h.p. They will carry 3,600 gallons of fuel oil, and can haul a 100-wagon freight train under average operating conditions between 450 and 500 miles before refuelling. Refuelling points for the new locomotives will be located at Montreal and Toronto, and routine servicing will be carried out at the C.N.R. Montreal shops.

Power for the locomotives is supplied by three 16-cylinder two-stroke engines, any one of which may be cut out of service temporarily for repair work. Running repairs may be made without interruption of service, including replacement of pistons, cylinder linings, and bearing



C.N.R. directors inspecting the new diesel at Montreal. Left to right: Messrs. R. C. Vaughan, Chairman & President; B. L. Daly, N. B. Walton, Executive Vice-President; E. J. Young, H. J. Symington, and J. A. Northey

shells. Current is led from the generator to traction motors located in the bogies, and geared directly to the driving axles. Automatic windscreen wipers and defrosters keep the cab windows clear in rain or snow. Leather-covered swivel armchairs afford comfort for both men on the footplate. There is an unobstructed view ahead from the cab, adjustable draught-excluding windows provide cooling in hot weather, while hot-water heaters keep the cab warm in winter. Two powerful air hooters are mounted on each cab.

The simplicity of the controls makes it possible for drivers of steam locomotives to take over the diesels after only a few practice trips with an instructor. Driving cabs are located at both ends of the locomotive.

Notes and News

Assistant Accountant Required.—An assistant accountant, not over 32 years of age and preferably single, is required by the Nigerian Government Railway for one tour of 18 to 24 months, with possible permanency. See Official Notices on page 759.

Assistant Engineers Required.—Assistant engineers, between 23 and 40 years of age, are required by the Rhodesia Railways in the normal and temporary establishments. Candidates must have a university degree in engineering or be an associate member of the Institution of Civil Engineers. See Official Notices on page 759.

Additional South Wales Services.—British Railways, Western Region, is augmenting its service between Paddington and South Wales on Tuesdays, Thursdays, and Saturdays, to July 15 and from September 7 to 25, with a restaurant car train, leaving Paddington at 6.55 p.m., for Newport, Cardiff and Swansea. As already announced, the 6.55 p.m. Paddington to Fishguard Irish boat train, which calls at Newport, Cardiff and Swansea, is running on all other weekdays, to September 25. On June 21, the 11 a.m. Milford Haven to Paddington commenced to run

each weekday, instead of Mondays, Fridays and Saturdays only, as at present, and a restaurant car is provided between Swansea and Paddington.

Scammell Lorries Limited.—The net profit for 1947, after taxation, was £116,478, an increase of £54,527. Reserves take £80,000, compared with £28,000 in 1946, and £43,976 is carried forward.

Canadian Rail and Air Deficits.—The Canadian House of Commons on June 14 gave a first reading to a Bill authorising the Canadian Government to make good the deficits of Canadian National Railways and Trans-Canada Airlines. The Bill also authorises the Canadian National Railways to issue \$85 million in securities for 1948 capital expenditure.

Manchester—Glasgow Restaurant Cars.—The restaurant cars which, due to shortage of suitable staff, could not be introduced on the London Midland Region Manchester—Glasgow route on the planned date of May 31, went into service on Monday, June 14. The trains involved are the 2 p.m. Manchester (Victoria) to Glasgow (Central), and 4.10 p.m. Glasgow to Manchester.

Rendel, Palmer & Tritton: Change of Address.—It is announced that the whole of the organisation of Messrs. Rendel, Palmer & Tritton will shortly be transferred to 125, Victoria Street, S.W.1. The present head office (at 55, Broadway) is being moved first, and the departments now at 53, Victoria Street, and at 16-20, Strutton Ground, will be moved to 125, Victoria Street on dates to be announced in due course. All correspondence should now be addressed: Messrs. Rendel, Palmer & Tritton, 125, Victoria Street, Westminster, London, S.W.1. The new telephone number is Victoria 8494.

Canadian-Built Locomotives for India.—An order for 60 4-6-2 steam locomotives to be produced at approximately \$7,500,000, for the Indian Government Railways, has been placed with the Montreal Locomotive Works Limited. The same company already is building ninety

2-8-2 locomotives for India, and delivery of the Pacific locomotives will begin in February, 1949. The new order is part of one for 100 locomotives, which was placed in Canada through the India Supply Mission, and payment will be made in U.S. dollars.

Liverpool Overhead Railway.—For the week ended June 13, traffic receipts of the Liverpool Overhead Railway were £2,732, a decrease of £113 over the corresponding period last year. At £65,728, total receipts for the year to date, represent an increase of £311 over the equivalent receipts for 1947.

Crompton Parkinson Limited.—The company is increasing its authorised capital by £850,000 to a total of £2,850,000 by the creation of 3,400,000 "A" shares of 5s. each. Of these, 1,025,932 are being offered to ordinary and "A" ordinary stockholders in the proportion of one new share for every ordinary and/or "A" ordinary stock unit held.

South African "19D" Class Locomotives.—The new series of "19D" class 4-8-2 locomotives, being built for the South African Railways by the North British Locomotive Co. Ltd., are fitted with Ajax grease equipment, supplied by Whitelegg & Rogers Limited. An illustrated article on these locomotives appeared in our issue of June 18.

Congress Encourages Tourist Spending.—Dollar income from United States tourists should increase by the raising from \$100 to \$40 of the exemption limit on duty-free goods American travellers may take into their country. This move sweeps aside a 51-year-old tariff statute. Original estimates by the British Travel Association of income from the U.S.A. tourist trade during 1948 was more than \$10 million, taking into account the money spent on British ships and aircraft, but as a result of this new move by Congress and the recent British Government concession this figure may be increased substantially.

Export of Small Tools to Canada.—Anticipating the recent Government decision to send a Board of Trade mission to study the possibilities of increasing the market for British engineering equipment in Canada, Mr. H. P. Potts, M.I.Mech.E., Managing Director, B.E.S.T.E.C., accompanied by representatives of three member companies, left London early this month to visit the International Trade Fair at Toronto, where British products were shown on the stands of Canadian agents. While in Canada, Mr. Potts and his colleagues will make a close survey of the market, and later will undertake similar investigations during a short stay in the United States.

Waste Paper Salvage Drive.—Representatives of the Waste Paper Recovery Association are calling on firms in all parts of the country to ask for an extra effort to be made during the next few months. Many firms which already have a regular system of collection in operation, recently instituted special drives to turn out old accumulations of waste paper, and some have expressed surprise at the amount they have thus been able to dispose of for salvage. For example, one Lancashire newspaper office, which has carried out a daily collection for some years, recently set aside a week for going through old files and records, with the result that over 20 tons of waste paper was released. In a similar effort another Lancashire firm was able to dispose of 16 tons. A leaflet has been

Waterloo Station Centenary



Passengers in period costume after alighting from the L. & S.W.R. passenger coach drawn into Waterloo Station by an Adams locomotive. An article dealing with the centenary appeared in our last week's issue

OFFICIAL NOTICES

Crown Agents for the Colonies

None of the vacancies on this page relates to a man between the ages of 18 and 50, inclusive, or a woman between the ages of 18 and 40, inclusive, unless he, or she, is excepted from the provisions of the Control of Engagement Order, 1947, or the vacancy is for employment excepted from the provisions of that Order.

SECTIONED PERSPECTIVE VIEW OF LOCOMOTIVE FRONT END. A notable drawing of L.M.S.R. class "7P" 4-6-2 locomotive of the latest type. Reprinted from *The Railway Gazette*, June 15, 1945. Price 2s. 6d. Post free 2s. 8d.

4-8-2 CLASS "15F" LOCOMOTIVES FOR THE SOUTH AFRICAN RAILWAYS. The latest examples of these main-line passenger and freight locomotives have been built by the North British Locomotive Co. Ltd. Reprinted from *The Railway Gazette* of September 20, 1946. Price 2s. By post 2s. 2d.

THE FIRST PASSENGER RAILWAY. By Charles E. Lee. A history of the Swansea & Mumbles Railway, which extends over 136 years. Cloth. 8½ in. by 5½ in. 91 pp. Illustrated. 5s. By post 5s. 3d.

issued by the Waste Paper Recovery Association, 52, Mount Street, London, W.1, which serves as a legal guide on the disposal of old books and papers. Firms having difficulty in getting their waste paper collected should get in touch with the Association.

Road Haulage Association Luncheon.—The Minister of Transport, Mr. Alfred Barnes, was principal guest at the annual luncheon of the Road Haulage Association, which was held at Grosvenor House, Park Lane, S.W.1, on June 23. Mr. B. G. Turner, Chairman of the Association, presided. A report of the proceedings will be given in our next issue.

British Timken Limited.—It was resolved at a meeting of the company on May 21 to increase its capital by £1,000,000. An issue is being made of 1,000,000 4 per cent. cumulative redeemable preference shares of £1 each at 21s. per share. The company has paid a dividend of 15 per cent. on the ordinary share capital for the past 10 years.

New Dunlop Tyre.—The Dunlop Rubber Co. Ltd. is introducing a new road vehicle tyre which incorporates a number of new features. Improved road grip has been achieved by increasing the number of non-skid teeth from 2,000 to between 2,800 and 4,800. The knife-cut principle across the tread has been further developed, and the treads have been made wider and flatter the better to distribute wear and load. It is estimated that skidding resistance has been increased by about 15 per cent. and average mileage life improved by 10 to 15 per cent. The tyre also possesses non-static properties which reduce interferences with car radio.

Transformer Company's Jubilee.—May 10 this year was the 50th anniversary of transformer engineering and development by the British Electric Transformer Co. Ltd., which, since 1932, has been associated with Crompton Parkinson Limited. An early speciality of the company due to its founder, Mr. A. F. Berry, was the air-cooled radial type of transformer, still in demand today with minor modifications and improved by the availability of better materials. During the recent war, the company produced about 15,000 transformers of different types and is engaged at present on units up to 60,000 kVA., and the development of designs for voltages above 200 kV. A new high-voltage laboratory is being built to study surge phenomena at the higher voltages. Since becoming associated with Crompton Parkinson Limited, the company has retained its separate

APPLICATIONS from qualified candidates are invited for the following post:—

ASSISTANT ACCOUNTANT required by the Nigerian Government Railway for one tour of 18 to 24 months, with possible permanency. Salary, including expatriation pay, £600, rising to £1,200 a year. Commencing salary according to age and war service. Outfit allowance £60. Free passages. Candidates, not over 32 years of age and preferably single, should be associate members or students of one of the recognised appropriate professional bodies and should have had experience in one of the following branches of accountancy:—Railway Revenue and Station Accounts; Civil or Mechanical Engineering Accounts and Costing; Statistics by Punched-Card Systems; Calculation and Payment of Wages; Stores Accounts; General Double-Entry Book-keeping. Apply at once by letter, stating age, whether married or single, and full particulars of qualifications and experience, and mentioning this paper, to the CROWN AGENTS FOR THE COLONIES, 4, Millbank, London, S.W.1, quoting M/N/16797/3E on both letter and envelope.

STATION DESIGN. A striking example of modern British practice at the important wayside station of Luton. Reprinted from *The Railway Gazette*, July 7, 1944. Price 1s. Post free 1s. 2d.

identity, but has been able to take advantage of such facilities as the use of the high-power test station at Chelmsford, opened in 1939, where short-circuit tests are made with transformers and reactors to assist development investigations.

Scottish and London Midland Regions Ambulance Competition.—An ambulance competition was held at Derby on June 11 between the London Midland Region and Scottish Region, British Railways. The result was as follows:—

	Total marks
Camden "A"	300
Motherwell	257½
Wolverton Works	247
Dundee Works	240½
Horwich Works	237
Glasgow Eglinton Street	218
	216

Mr. G. L. Darbyshire, Chief Regional Officer, L.M.R., presented the prizes.

Scottish and L.M. Regions Ambulance Competition



Mr. G. Kirkham (holding trophy) with Camden "A" team, L.M.R. (see paragraph above). Behind (wearing coat) is Mr. C. Hopkins, London District Ambulance Secretary, L.M.R.

Rhodesia Railways

APPLICATIONS from qualified candidates, aged about 23 to 40, are invited for Assistant Engineers' posts on the Rhodesia Railways in the normal and temporary establishments. Candidates must have a University Degree in Engineering or be an Associate Member of the Institution of Civil Engineers; in addition, railway civil engineering experience is essential for older men and railway training desirable for younger men. A knowledge of structural design and construction details of railway structures and track is required. Commencing salary in the scale £400-£30-£820 according to age and experience, with cost-of-living allowance of 14 per cent. at present in addition, plus children's allowances. Free passages to Rhodesia for selected candidates. Applicants should be prepared to go to Rhodesia without families in the first instance, as housing accommodation cannot be provided by the Rhodesia Railways. Successful applicants will be required to join contributory Pension Fund and Medical Fund. Prospects of consideration later for normal establishment to those in temporary appointments.

Apply by letter stating age, whether married or not, and full particulars of qualifications and experience or training to: THE RHODESIA RAILWAYS LIMITED, 11, Old Jewry, London, E.C.2.

Canadian Pacific Railway.—At a meeting of the board of directors of the Canadian Pacific Railway at Montreal on June 14, a dividend of 2 per cent. on the preference stock in respect of the year 1948 was declared. It will be payable on August 2 to stockholders of record on July 1.

South Wales Transport Co. Ltd.—Mr. Raymond W. Birch, Chairman of the South Wales Transport Co. Ltd., foretold disadvantages for the people of Swansea at the annual meeting should the British Transport Commission produce an "area scheme" for their locality. In the first place, they would lose their direct interest in the profits of their local company, with a consequent increase in the rates. Secondly, there was no doubt that any area scheme would have to take into account the present discrepancy between road and rail fares, with the inevitable

effect that, as in the case of London, where the receipts from road and rail services had long been pooled, the bus fares would go up. He was proud to say that the fares of their company were at the same level today as when it was formed in 1914, but he was afraid that this position would alter materially under any form of nationalisation. During the year, their working week had been reduced from 48 to 44 hr. with no loss of pay, and only recently there had been further increases in pay amounting in the case of drivers and conductors to 7s. 6d. on their basic rates.

Rees Jeffreys Research Studentship.—Through the action of Mr. W. Rees Jeffreys, a scholarship at the approximate rate of £200 a year, recently has been established at the London School of Economics. The Founders objective is to promote research into the economics and means of transport, to secure balanced development of the various forms of transport and progressive lowering of charges. The first of these studentships will be granted for the year 1949 and it is intended that a suitable candidate should be able to devote at least one year to the work. Applications should be received by the Secretary, London School of Economics, not later than October 31, 1948.

International Tourist Secretariat.—The General Assembly of the International Union of Official Travel Organisations, at a conference held in Oslo from June 14-19, decided on London as the home of its permanent Secretariat. Mr. E. W. Wimble, representative of the British Travel Association on the Executive Committee, was elected President of the Union. At the above conference, which was attended by delegates from 46 countries, Mr. Wimble, who is Chairman of the Home Holidays Division of the British Tourist & Holidays Board, surveyed the European tourist industry and showed how it can play a part in European recovery, and Mr. J. G. Bridges, Director-General of the British Travel Association, presented a report on travel statistics.

Road Haulage Regulations.—As part of the machinery for bringing into operation Part III of the Transport Act, 1947, which relates to road goods transport, Mr. Alfred Barnes, Minister of Transport, has made regulations covering the serving of notices for the acquisition of vehicles, compensation payments not exceeding £2,000 in cash, and the fixing of operating centres for goods vehicles which will be affected by future restrictions on long-distance carriage of goods. There are three groups of regulations, all of which operate on July 1, 1948, namely, the Road Haulage Undertakings (Notices of Acquisition, etc.) Regulations, 1948; the Road Haulage Undertakings (Payment of Compensation) Regulations, 1948, and the Goods Vehicles (Operating Centre) Regulations, 1948. Copies of these regulations can be obtained from H.M. Stationery Office.

Forthcoming Meetings

June 30 (Wed.).—The Institute of Welding, at the Institution of Civil Engineers, Great George Street, Westminster, S.W.1, at 2.30 p.m. Annual General Meeting.

July 3 (Sat.).—Electric Railway Society, at the Fred Tallant Hall, Drummond Street, London, N.W.1, at 3 p.m. "Black Saturday on the Southern Railway," by Mr. G. T. Moody.

July 3-8.—The Permanent Way Institution, Summer Convention in Chester.

Railway Stock Market

Brazilian railway and utility stocks have featured in stock markets with heavy declines after publication of the Anglo-Brazilian pact. Losses of down to 7 points have been recorded in debenture stocks of some of the utility concerns which were the centre of considerable speculative activity earlier in the year on take-over talk. Biggest slump, however, was in San Paulo ordinary stock, which after publication of the Anglo-Brazilian pact on Friday had dropped to 164 early this week, a loss of nearly 20 points in a few days. There was some selling on suggestions that payment may not be made until towards the end of this year and that some years might elapse before payment would be made for other interests, despite the fact that the railway was taken over by Brazil as far back as September, 1946.

So far as the San Paulo Railway is concerned, the market believes that as soon as it is possible to clarify the true position as to payment for the railway and the position as to ancillary interests, an official statement will be issued to stockholders. Assuming a fair payment for ancillaries, it continues to be assumed in many quarters that a price of £200 should be justified for San Paulo ordinary stock.

Reflecting the trend in Brazil stocks, Leopoldina ordinary have come back to 11 at the time of writing, the preference stock to 32½ and debentures to 65, while Leopoldina Terminal debentures were only 61. Great Western of Brazil shares moved down to 67s. 6d.

Brightest feature of markets (which were influenced more by the dock strike earlier in the week than by the latest Marshall Aid developments) was strength of British Funds. In part this reflected "safety first" investment, but also the trend of opinion that British Gas stock will be longer dated than generally expected a few weeks ago. British Electricity 3 per cent. have been prominent, but after changing

hands up to 100½, eased to par, profit-taking developing. This was later followed by fresh buying. Electricity 3 per cent. are the first of the nationalisation stocks to go over par. The 3 per cent. "Wagon" stock, which is also dated 1968-73, strengthened in sympathy, but has not yet reached par. There is a good deal of selling of this stock on any fractional improvement in price, the policy of some colliery companies being to sell with a view to accumulating cash and making a partial return of capital to shareholders. There has been a big turnover in the leading 3 per cent. Transport stock (1978-88) around 96½. In this case also there is considerable selling on any improvement. Nevertheless, according to some views, it is not unreasonable to assume that over the next few months it may go to par.

Canadian Pacific, after touching 27, eased to 26½. Antofagasta ordinary and preference stocks changed hands around 12½ and 66 respectively. Beira Railway bearer shares eased to 53s. 1½d. and United of Havana 1906 debentures to 17½. Moreover, on further consideration of the purchase offer for the railway, Nitrate Rails shares have dropped to 80s.

There were movements against holders in iron and steel shares, but they were mostly very moderate, with Dorman Long at 29s. 6d., United Steel 27s. 10½d. and Vickers 28s. 9d. Elsewhere, Babcock & Wilcox at 67s. 3d. fell back sharply with the general trend, and Tube Investments eased to slightly below £6. North British Locomotive were active around 23s. 3d. with Wagon Repairs 5s. shares at 20s. 6d. following publication of the results. Road Transport shares remained firm and active, those of several of the operating companies again moving slightly higher on balance. Tillings after touching the new high level of 103s. 9d. have receded to 101s. 6d. B.E.T. after rallying to £1,800 came back to £1,770 after the meeting.

Traffic Table of Overseas and Foreign Railways

Railways	Miles open	Week ended	Traffics for week		No. of week	Aggregate traffics to date			
			Total this year	Inc. or dec. compared with 1946/47		Total	Increase or decrease		
						1947/8			
South & Central America	Antofagasta ...	834	13.6.48	£48,890	+ 9,620	23	£1,231,170	+ 284,990	
	Bolivar ...	174	May, 1948	\$23,890	- \$91,340	22	\$398,711	- \$166,167	
	Brazil ...	...	...	...	...	...	...	...
	Cent. Uruguay ...	970	12.6.48	40,356	+ 9,068	50	1,849,168	+ 10,133	
	Costa Rica ...	262	Apr., 1948	18,379	- 15,486	43	310,730	+ 23,965	
	Dorada ...	70	Mar., 1948	19,700	- 9,500	13	59,500	+ 30,000	
	G.W. of Brazil ...	1,030	12.6.48	24,000	- 900	23	832,100	+ 32,900	
	Inter. Ctl. Amer. ...	794	Apr., 1948	\$1,218,460	+ \$59,490	17	\$4,812,683	+ \$62,337	
	La Guaira ...	223	May, 1948	\$116,449	+ \$731	22	\$523,981	+ 48,780	
	Leopoldina ...	1,918	12.6.48	41,936	- 17,795	23	1,222,024	+ 278,691	
	Midland Uruguay ...	319	May, 1948	22,020	+ 3,724	48	208,409	+ 21,309	
	Nitrate ...	382	15.6.48	12,178	+ 1,266	23	133,458	+ 31,364	
	N.W. of Uruguay ...	113	May, 1948	5,699	+ 1,561	48	60,982	+ 2,197	
	Paraguay Cent. ...	274	11.6.48	\$77,581	+ \$16,208	49	\$3,363,196	+ \$204,475	
Canada	Peru Corp. ...	1,059	May, 1948	180,761	+ 22,005	48	1,907,324	+ 230,353	
	Salvador ...	100	Mar., 1948	\$240,000	+ \$31,000	39	\$1,621,600	+ \$283,600	
	San Paulo ...	1534	...	...	...	...	...	...
	Taltal ...	156	May, 1948	8,940	+ 5,240	48	89,020	+ 44,305	
	United of Havana ...	1,301	12.6.48	44,561	- 18,213	50	3,784,749	+ 318,100	
	Uruguay Northern ...	73	May, 1948	1,850	+ 1,615	48	13,995	+ 2,231	
	Canadian National ...	23,535	Apr., 1948	10,235,250	+ 1,230,500	18	36,902,750	+ 2,829,000	
	Canadian Pacific ...	17,037	Apr., 1948	6,880,000	+ 318,250	18	26,269,500	+ 1,870,750	
	Various	Barsi Light ...	202	May, 1948	27,150	+ 4,575	8	57,877	+ 6,007
		Beira ...	204	Mar., 1948	130,824	+ 33,115	26	711,144	+ 167,195
Egyptian Delta ...		607	20.4.48	18,085	+ 2,529	3	36,417	+ 3,239	
Gold Coast ...		536	Apr., 1948	224,588	+ 60,636	4	224,588	+ 60,636	
Manila ...		...	...	...	...	...	...	...
Mid. of W. Australia ...		277	Apr., 1948	29,873	+ 9,898	43	239,345	+ 64,049	
Nigeria ...		1,900	Mar., 1948	401,873	+ 40,277	52	4,581,601*	+ 49,128	
Rhodesia ...		2,445	Sept., 1947	643,980	+ 102,833	52	6,787,603	+ 612,938	
South African ...		13,323	15.5.48	1,325,427	+ 137,473	7	8,506,173	+ 570,663	
Victoria ...	4,774	Feb., 1948	1,421,349	+ 234,015	35	...	...

* Receipts are calculated @ 1s. 6d. to the rupee

* Aggregate figures to March 20

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